

University of Dundee

The Evaluation of the FLaT Highland Future Schools Project

Payne, Frances Mary; Bain, Yvonne Catherine; Coutts, Norman Charles; Gooday, Margaret Ann; McGovern, Matt; Spratt, Jennifer Carol

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**The Evaluation of the FLaT
Highland Future Schools Project:
Ardnamurchan High School
and
Glen Urquhart High School**

**FINAL REPORT
April 2007**

**Fran Payne
Yvonne Bain
Norman Coutts
Margaret Gooday
Matt McGovern
Jennifer Spratt
Christina Walker**



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The Highland Future Schools Project is an ambitious and innovative initiative undertaken by teachers and pupils at Ardnamurchan High School and Glen Urquhart High School. We would like to thank the senior management team, staff, pupils, community education staff and parents from both participating schools/community centres, and the local authority personnel involved in the project, for allowing us to share their experiences, and hope that others planning similar developments elsewhere will learn from their experiences.

April 2007

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EXECUTIVE SUMMARY

Introduction

Two purpose built community high schools, Ardnamurchan High School which was a new school, and Glen Urquhart High School which was a new building, opened in August 2002 in Highland Region, as a result of active campaigning by local community members and councillors over an extended number of years.

The Highland Future Schools Project

The Highland Future Schools (HFS) Project funded by the Scottish Executive Education Department's (SEED), Future Learning and Teaching (FLaT) Programme (between March 2002 and March 2004), was conceived by the Local Authority Director of Education during the planning stages of the two schools. The project was seen as an opportunity to provide and use technology in support of learning to enable further and better opportunities for both schools and their local communities. The important role of the school in the community is evident in the HFS project, the aim of which is to use ICT to:

- *raise achievement of school pupils;*
- *enhance school links with the wider community;*
- *increase the local skills base through home-school-community ICT partnerships.*

The two schools were purpose built to similar designs. However, they have sought to shape their participation in the project to match their individual circumstances, and maximise the benefits to their pupils, teachers, parents and local communities. Each school received ICT equipment, including a laptop for each member of staff to use for their own professional purposes. In Ardnamurchan High School each pupil has been given personal use of a laptop/tablet PC. Glen Urquhart High School received laptops, but not for personal use by pupils. They were used in classrooms as an additional resource together with existing desktop computers, and were a shared resource throughout the school.

This executive summary brings together the findings from both schools under the four aims of the evaluation. The main body of the report deals with each school separately.

Evaluation of the Highland Future Schools Project

The evaluation of the project commenced in March 2005 and concluded in May 2006. It has four main aims.

- Aim 1** Assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools;
- Aim 2** Identification of what, if any, impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment;
- Aim 3** Assessment of the project's impact in improving home-school and community links and building partnerships with other educational/training providers;
- Aim 4** Identification of what, if any improvements the use of ICT has made in terms of developing and delivering greater learning and teaching opportunities for teachers, pupils and adult learners.

Methodology

The methodology has combined quantitative and qualitative approaches in both schools. It included: a questionnaire survey of teachers, pupils and parents; semi-structured interviews with a sample of teachers and pupils; semi-structured interviews with the Headteachers, ICT coordinators; community education staff, local authority staff; and classroom observations.

Summary of Findings

We present a summary of our findings listed under each of the four evaluation aims.

Aim 1

The assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools.

a) The local authority

- The Authority provided the ICT infrastructure and resources necessary to set up and maintain the project in both schools. However, it was constrained by the existing service level agreement with the managed service provider (MSP), which allowed it very little flexibility to support the schools.
- Despite the Authority's best efforts and regular communication with the schools it was often unable to promptly resolve many of the ongoing technical problems experienced by the schools, for example, the restrictions on access to the school intranet due to the terms of the agreement with the MSP.
- The Authority acknowledged it had not anticipated some of the problems, for example, synchronisation of files, which arose from individual use of laptop/tablet PCs.
- The ongoing costs of laptop provision for Ardnamurchan High School were borne by the Authority.
- The Authority was aware that such a heavily ICT resourced project required some commitment to sustain it in both schools, with a need to continually upgrade resources.

b) The school/senior management team

- The schools benefited from the provision of new ICT resources and facilities for teaching and learning.
- The school/senior management teams were supported by the Authority, but prevented from achieving certain aims, i.e. home-school links, due to the terms of the Authority's existing service level agreement with the MSP.
- The schools were dependent on the Authority to sort out the variety of technical problems which ensued.
- The schools were constrained by a lack of onsite technical support which prevented them from taking a proactive approach to problems as they arose.
- The schools had concerns about the replacement costs of the desktop and laptop/tablet PCs when newer models were required.
- Ardnamurchan High School was supported by the Authority to enable it to lease laptops after the two years of SEED support ended.

c) The teachers

- Use of a personal laptop gave teachers the flexibility of use between school and home. It assisted teachers in the preparation and presentation of teaching material and administration tasks.
- Technical difficulties hindered the project's development, such that the impact of ICT has been varied and perhaps slow to effect a change in pedagogy. Some departments for example, technology in Ardnamurchan High School, had made significant advances in the use of ICT.
- Ardnamurchan teachers incurred additional problems to the Glen Urquhart teachers due to the pupils using personal laptop/tablet PCs: the technical problems; time delays in class logging on to the server and no guarantee that all pupils would bring the laptop/tablet PCs to the class.

d) The pupils

- The enhanced ICT resources increased pupils' ICT skills, motivation and engagement with learning.
- The use of ICT provided an enriched curriculum for pupils.
- ICT provided easy access to resources for pupils, a curriculum and resources better targeted to different styles of learning.
- ICT offered opportunities for pupils to learn independently/take responsibility for their own learning. However, the use of ICT by pupils was predominantly determined by the teachers.
- ICT enhanced presentation of work, and was an aid to revision: providing summaries which saved pupils time from having to write their own notes.
- Personal mobile technologies have the potential for furthering pupil independence and ownership of learning.
- Use of the internet distracted pupils from tasks because they visited non-relevant sites, and using ICT also wasted pupil time due to delays in logging in/starting up machines.
- Some pupils were more interested in the use of ICT to aid presentation of their work rather than its content.
- Pupils were unable to work seamlessly between school and home because they could not routinely access materials from the school intranet.
- The use of ICT has the potential for health and safety issues due to pupils sitting in front of computers for long periods of time.

Laptop/tablet PC use

- The lack of network connections, unreliability of the laptop/tablet PC, the unavailability if it was being repaired, and various technical problems resulted in pupil de-motivation and frustration.
- Pupils also voiced frustration if the laptop was not frequently used, mainly as it was considered to be too heavy to carry around all day.

e) The adult learners/community users (including parents)

- The opening of the new buildings brought facilities and resources, learning opportunities to the community which were previously inaccessible without travelling long distances.
- Incompatibility of firewall systems between the community and school caused problems for providers.
- There appeared to be some lack of clarity in the communication between school personnel and community educators around ownership and access to ICT equipment, in particular during the early days of the project at Glen Urquhart High School.
- The location of ICT equipment within the school building raised issues of safety if members of the public were using equipment during the day. This caused some tension between the different needs of the school and the community within the shared building, with the former looking to ensure safety of its pupils, and the community facility wanting to encourage adult access in a user-friendly manner.

Aim 2

The identification of what, if any, impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment.

a) Attainment, achievement, motivation and attendance

- With respect to raising achievement, qualitative reports from teachers, pupils and parents indicate that using ICT has had a positive impact on pupils' motivation, enthusiasm for and engagement with learning, and has raised the level of pupils' ICT skills.
- Over three quarters of teachers strongly agreed/agreed that '*using ICT leads to raised attainment for many pupils*'. However, they felt unable to provide hard indicators for this.
- In order to assess whether the personal use of a laptop/tablet PC by pupils had made any impact on attendance, the quantitative data collected by Ardnamurchan High School on pupil attendance and behaviour was scrutinised. The data presented an inconclusive picture. It is also difficult to make any claims as to the impact of the project on attendance, as other variables/school initiatives may have had a greater impact.

b) The learning and teaching environment

- The project has enabled the two new school buildings to be equipped with state of the art technology.
- For Glen Urquhart High School it has enhanced provision compared to the previous lack of ICT equipment in the old school building.
- For Ardnamurchan High School it has provided ICT resources and facilities in a location where previously no high school existed.
- The ICT facilities and resources include personal laptops for all staff in both schools, and personal laptops or tablet PCs for pupils in Ardnamurchan High School; interactive whiteboards and data projectors in some classes; suites of desktop machines in ICT, graphic communication, and videoconferencing equipment.

Aim 3

The assessment of the project's impact in improving home-school and community links and building partnerships with other educational/training providers

a) Home-school-community links

- The intention to provide home-school links through the use of ICT for teachers and pupils, with teachers and pupils accessing work from the school intranet, proved impossible for the MSP, local authority and schools to achieve, due to a combination of technical and network security reasons.
- One aspect of ICT use beginning to be introduced by some teachers was the use of email for communication with parents. This has supported links between home and school.
- Similarly, the aim to improve school-community links for the adult learners and community users was hampered for network security reasons, with the managed service provider being unwilling to allow external access to the school network. This resulted in the partner providers or community staff having to install their own firewall systems.

b) Building partnerships with other educational/training providers

- The level of success appears to have depended to some extent on how the partnership arrangements were initially established when the centres opened.
- The development and sustaining of partnerships has proved to be more successful at Ardnamurchan High School, where initially personnel were employed on a joint local authority/FE partnership which helped to establish a firm FE presence. Even here, according to community centre staff it has taken many years to 'bed in' community provision.
- The local FE college withdrew support from the Glen Urquhart community centre, probably for financial reasons, by not replacing a staff member who left. The attempt to secure ongoing FE provision opportunities was due to the efforts of the community learning centre officer who was employed by the local authority.

Aim 4

The identification of what, if any improvements the use of ICT has made in terms of developing and delivering greater learning and teaching opportunities for teachers, pupils and adult learners.

a) The teachers

- The use of ICT helped to develop and deliver greater learning and teaching opportunities for teachers.
- All teachers reported they use email to network and conduct professional exchanges with colleagues in their subject areas, and half indicated they are already participating, or beginning to participate, in online discussion groups.
- Less well developed is their use of ICT for their own professional development, for example, taking a CPD course online, (reported by up to one third), although more teachers (up to a half) were thinking of doing so in the next one to two years.
- The project provided support for ICT training that has helped the teachers improve their own ICT skills, and this has impacted on their teaching practices.
- Teachers now use a variety of ICT technologies: personal laptop; data projector; and an interactive whiteboard. The teachers have used ICT to create and edit their own learning materials, particularly differentiated materials.
- The data projector and interactive whiteboard enabled them to produce more visual and interactive materials. This included the use of image projection on the interactive whiteboard to enhance explanations of three dimensional or dynamic concepts.
- The use of the internet has enabled teachers to access key resources and information from specific curriculum websites. It also provided access to some ODL (online distance learning) courses and enabled the schools to now offer and deliver new courses which previously would not have been available for pupils.
- Teachers have used ICT principally as a tool to improve their existing teaching and learning practices. There was an acknowledgment that further support and training are needed to fully integrate ICT into the curriculum, and further develop more flexible and novel approaches to teaching and learning.

b) The pupils

- ICT has provided the pupils with access to greater learning opportunities. The internet has improved access to key resources, and the availability of online learning materials, for example, Scholar.
- Online learning materials together with self-assessment software have allowed pupils to learn independently and receive feedback on their performance.
- In some subject areas the use of simulations, animations etc. enabled pupils to experience learning more visually, for example, the rotation of chemical molecules, or to run experiments which are not practical to do in the classroom.
- ICT helped to remove barriers to learning for those with literacy difficulties and opened up learning opportunities via email communication with schools overseas.

c) Adult learners/community use

- The provision of greater learning opportunities has been mixed and has evolved at different rates at each school.
- The uptake of higher and further education learning opportunities by the community has proved more successful at Ardnamurchan High School. Students can access lectures/tutorials from the local FE college via videoconferencing, and access online courses from the UHI Millennium Institute.
- The adult learning opportunities were less well developed in Glen Urquhart High School. Whilst the intention of the school was to '*create a local learning and communications web across all areas of the local communities served by the school*', this has been limited, partly due to the local FE college being unable to sustain a presence and provide learning/training opportunities locally for students.

Conclusion and Recommendations

The Highland Future Schools Project is best represented as a journey still being undertaken. Like many educational developments it is more evolutionary than revolutionary in character. Some of the project aims were rendered unachievable by circumstances, whilst others are still in development. It will take a considerable time for the project to become fully embedded in the schools, and for them to achieve all their aspirations.

The increasing use of ICT in schools, which potentially brings opportunities for pupils and teachers to work seamlessly between school and home, requires a level of ICT infrastructure and support that is beyond that which local authorities can offer on their own. The HFS Project highlighted a number of tensions and difficulties in and around the provision of reliable and effective computer and network services for teachers, pupils, schools and communities. Until these problems are resolved, schools, teachers and pupils will find it difficult to use ICT to its full potential for teaching and learning purposes.

On the basis of our findings, the lessons learned, innovations observed and advice suggested by each group of stakeholders, we make the following recommendations to other local authorities and schools considering undertaking similar initiatives, both the provision of laptops for teachers and/or pupils, and joint school/community provision.

The Local Authority

Should:

- build in flexibility to the service level agreement with the MSP to ensure it is affordable, but reduces additional on-going costs, and is fully set up to meet educational needs;
- keep some element of provision of ICT support in-house;
- conduct a risk analysis at the planning stage, and have contingencies available if original intentions do not go according to plan;
- be aware that an ICT project requires not just one-off costs, but a commitment to sustain it, including the upgrading and replacement of equipment;
- consider leasing rather than purchasing laptop/tablet PCs;
- provide an ICT infrastructure in schools fit for purpose;
- test out the ICT systems in a limited pilot, particularly when using mobile technologies, before introducing to the whole school;
- contribute to effective project management;
- provide good technical support to the school;
- develop a good working partnership with the school;
- regularly communicate with the school to monitor and review the process;
- provide training, support and advice to schools for the integration of ICT into the curriculum;
- in the planning stages seek reports/research evidence of similar initiatives in other schools/local authorities;
- in the planning stages when designing a building for joint school/community use, consider the differing needs of school and adult users, both in terms of access and security;
- keep a written record of decision taking etc. for continuity in case staff leave their position.

Schools and the Senior Management Team

Need support from the local authority to provide:

- a powerful and robust infrastructure to deliver learning and teaching visions;
- reliable and up-to-date equipment which is fit for purpose;
- ongoing technical support;
- an effective ICT infrastructure to support mobile technologies;
- help with integrating ICT into the curriculum;
- funding for up-dating/renewing of equipment as necessary.

Should:

- conduct a risk analysis at the planning stages, and have contingencies available if original intentions do not go according to plan;
- in the planning stages seek reports/research evidence of similar initiatives in other schools/local authorities;
- be flexible and if original intentions are not possible, consider and implement contingency plans rather than pursue a lost cause;
- communicate regularly with all relevant parties, e.g. the local authority;
- provide technical support to the staff and pupils;
- manage reliability problems to reduce their impact on learning and classroom routines;
- provide training/staff development opportunities for staff to integrate ICT into the curriculum;
- encourage staff to share good practice in the use of ICT for teaching and learning;

- achieve an appropriate blend of desktop and portable computer availability to maximize the flexibility and cost effectiveness of provision;
- establish and maintain good working partnership arrangements with the community provision;
- be aware of the need to balance the security issues for pupils with the community needs, to ensure user-friendly access for adults in shared school/adult provision.

Laptop/tablet PC use

- invent systems and protocols which embed a culture and expectation of use by teachers and pupils;
- consider the most effective deployment of laptop/tablet PCs within the school to benefit pupil use.

Teachers

Need:

- technical support;
- training/staff development/time to fully integrate ICT into curricular areas.

Should:

- create lesson start-up routines and procedures which pre-empt problems of initial computer and network start-up delays.
- create an expectation that laptop/tablet PCs will be used for most lessons if pupils are given personal use of one;
- give more ownership/control of ICT use to empower pupil learning;
- consider adapting the curriculum to using ICT, rather than simply using as a tool;
- acknowledge the ICT skills/knowledge pupils already have from their own personal and social uses.

Pupils

Need:

- a dedicated person within the school to go to for technical support;
- a place to store a laptop/tablet PC to save carrying it around all day.

Should:

- have an expectation that laptops/tablet PCs will be used for most lessons;
- be given greater responsibility and opportunity to choose when to use ICT;
- take responsibility for using a laptop/tablet PC.

Community

Need:

- regular on-site presence of staff to encourage and sustain student provision;
- establish and maintain good working partnership arrangements with the school;
- a dedicated separate entrance in a shared school/community building.

SECTION 1

THE PROJECT AIMS, THE REMIT OF THE EVALUATION AND METHODOLOGY

1.1 The Highland Future Schools Project

1.1.1 Introduction

Two purpose built community high schools, Ardnamurchan High School (AHS) which was a new school, and Glen Urquhart High School (GUHS) which was a new building, opened in August 2002 in Highland Region, as a result of active campaigning by local community members and councillors over an extended number of years. Each school is designed to support lifelong learning, and offers significant benefits for the local communities. The specific details of the context and background of the two schools are described in Sections 2 and 3 respectively.

The Highland Future Schools Project (HFS) funded by the Scottish Executive Education Department's (SEED), Future Learning and Teaching (FLaT) Programme, was conceived by the Local Authority Director of Education during the planning stages of the two schools. It was seen as an opportunity to provide and use technology in support of learning to enable further and better opportunities for both schools and their local communities.

Funding for the HFS Project was provided by SEED from March 2002 to March 2004. The local authority has provided financial support to AHS for two years (2004-06) to enable it to lease laptops for use by each incoming S1 year group.

1.1.2 Aims of the project

The important role of the school in the community is evident in the HFS Project, the aim of which is to use ICT to:

- raise achievement of school pupils;
- enhance school links with the wider community;
- increase the local skills base through home-school-community ICT partnerships.

The specific aims of the Highland Future Schools (HFS) Project in relation to each school are detailed in sections 2 and 7. In our preliminary discussions and subsequent interviews with the Headteacher and coordinator of AHS and the coordinator of GUHS, it emerged that each school has developed the use of ICT for learning, teaching and school administration in different ways to accommodate their local needs. Although the two schools were purpose built to similar designs to bring the benefits of lifelong learning to their communities and are partners in the HFS, they have sought to shape their participation in the project to match their individual circumstances and maximise the benefits to their pupils, teachers, parents and local communities.

Both schools were provided with ICT equipment and all the staff were given a laptop for their own use for professional purposes. At Ardnamurchan High School each pupil has been given personal use of a laptop/tablet PC. Although laptops were included in the equipment purchased for Glen Urquhart High School, there was no intention they would be deployed for pupils' personal use. They are used in classrooms as an additional resource, together with existing desktop computers, and are a shared resource throughout the school.

The intention of the project to develop home-school links has been severely curtailed in both schools due to the managed service provider (MSP) not being able to resolve security concerns about access to the school network at home for pupils, parents and teachers. Also the internet cannot be accessed on the school laptops when used at home.

1.2 The Remit of the Evaluation Project

The evaluation project has four main aims outlined below.

Aim 1

Assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools;

Aim 2

Identification of what, if any, impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment;

Aim 3

Assessment of the project's impact in improving home-school & community links and building partnerships with other educational/training providers;

Aim 4

Identification of what, if any improvements the use of ICT has made in terms of developing and delivering greater learning and teaching opportunities for teachers, pupils and adult learners.

The evaluation project commenced in March 2005 and concluded in May 2006. We report on the data collected from the participants: the Headteachers, ICT coordinators, the teachers, the pupils, and the parents from each school; the community centre staff and Local Authority personnel.

The evaluation takes account of the different contexts and arrangements within the two schools but has used the same methodologies. As the project has been implemented differently in each school, the data from the evaluation of each school is reported separately in subsequent sections: Ardnamurchan High School (sections 2-6); and Glen Urquhart High School (sections 7-11). Section 12 discusses the local authority perspective and the Headteachers' final reflections. The final section, 13, draws together the overall findings and discusses the conclusions and recommendations from the evaluation of both schools.

1.3 Methodology

The methodology has combined quantitative and qualitative approaches in both schools. It included: a questionnaire survey of teachers, pupils and parents; semi-structured interviews with a sample of teachers and pupils; semi-structured interviews with the Headteachers, ICT coordinators, community centre staff, local authority staff; and classroom observations.

The questionnaires were designed to address the main aims of the project and to explore each of the individual research questions outlined in the proposal. The questions were largely closed, offering a predetermined range of responses, but a number of open questions were included. Statistical analysis of closed questions was undertaken using the software, Statistical Package for the Social Sciences (SPSS), whereas themes identified by answers to open questions were coded prior to statistical analysis.

Interview schedules employed more open-ended questions, also related to the project aims, but which encouraged interviewees to reflect in greater depth on their own experiences and impressions of the project. The interviews were audio-tape recorded with the permission of the participants and transcribed. Manual analysis as well as the use of Nvivo software was based on inductive techniques using a system of coding to identify themes.

Some classroom observations also took place for purposes of triangulation, and to familiarise researchers with the classroom context in which the technologies were being used. The methodology in the two schools was broadly similar, but owing to differences in the local contexts, research instruments were modified slightly in order to ensure relevance to the participants in each setting.

1.3.1 SMT and ICT coordinators

Preliminary face-to-face interviews were conducted with the Headteacher at Ardnamurchan High School and the ICT coordinators in both schools during May 2005. These interviews provided background information and a context to the project in each setting, as well as the details about its implementation. The interviews assisted the researchers in planning practical arrangements for the evaluation. The ICT coordinators were interviewed again in September and October 2005 following the pupil and teacher interviews, for the purposes of clarification of issues arising in the intervening period and reflection on earlier discussions.

At the conclusion of the evaluation in May 2006 the Headteacher of Ardnamurchan High School was interviewed again. The former Headteacher of Glen Urquhart High School in post when the school opened was interviewed in May 2006, as well as the new Headteacher who took up post in August 2005. The interviews were all conducted via telephone. The aim of the interviews was to gather their overall reflections of the project and elicit their views of the key issues arising from the project's implementation.

1.3.2 The teachers

a) Interviews

Face to face interviews were conducted with a sample of teaching staff in each school, Ardnamurchan High School (N=4) and Glen Urquhart High School (N=7) during September and October 2005. The samples were selected by ICT coordinators according to the criteria specified by the research team. Requests were made to speak to a range of teachers including those who were thought to be most innovative and enthusiastic about the new technologies, but also some staff whose skills were less well developed. Researchers were satisfied that these criteria were met by the sample selected. The aim of the interviews was to gather information on the teachers' perceptions of the project including their understanding and expectations, the training provision, teaching methods, the process and products of learning, pupil motivation, attainment and more general achievement measures. Additional information was gathered on ICT resources, reliability and software availability.

b) Questionnaire

A questionnaire was sent electronically to the two school ICT coordinators in March 2006 and they were asked to distribute this to the staff (including full time, part-time and temporary). The teachers were asked either to complete and return it electronically, or alternatively to print a copy and return the completed copy in a prepaid addressed envelope supplied by the researchers which was available at the school office. Paper copies were also supplied to both schools. Twenty five questionnaires were returned AHS (N=15), and GUHS (N=10), a response rate of 94% and 44% respectively. The questionnaires gathered more detailed information on the areas covered in the interviews.

1.3.3 The Pupils

a) Questionnaires

Questionnaires were administered during May and June 2005 to pupils in each year group (S1-S6). The questionnaires for S1-S5 pupils were completed in a classroom setting, excluding only those pupils who were absent on that day. The questionnaires for S5 and S6 pupils who had recently left the school prior to external examinations were sent to their home addresses. Despite a reminder letter and questionnaire sent to the pupil leavers a couple of months later, the number of questionnaires returned was very small (AHS

N=2, GUHS N=4). Thus caution needs to be taken in interpreting the data as they may not be representative of the year group. The overall response rate for AHS was 64% (N=80), and for GUHS 71% (N=160). Although the data were recorded and analysed separately for each year group, it was decided to amalgamate the responses in each school for years S1 and S2, S3 and S4, and S5 and S6, (appendices 1-4, and appendices 5-8).

Multiple differently worded versions of the questionnaire were produced to accommodate the different ICT provision at Ardnamurchan High School and Glen Urquhart High School, the varied use of laptops and tablets in the different year groups at Ardnamurchan High School, and some pupils having already left the schools. The questions asked were designed to elicit information from the pupils about their opinions and views on the use of ICT and laptops/tablet PCs (principally for Ardnamurchan High School) and the learning experience, the uses in curricular areas, frequency of use, the positive and negative aspects of using ICT (GUHS) and laptops/tablet PCs (AHS), and range of uses of ICT outwith the school.

b) Interviews

Following analysis of the questionnaires, S4, S5 and S6 pupils in each school were interviewed in small groups of three or four, from the same year group (Ardnamurchan High School N=20: 11 male and 9 female pupils) and (Glen Urquhart High School N=18: 8 male and 10 female pupils). It had been the intention to interview a sample of S4-S6 pupils from a range of ICT competences, (below average, average, and above average), from a list identified by the school). However, the choice of interviewees was restricted by the return of parental permission forms, so the sample was self-selected, but never the less reflected a good mix of gender and competencies, as planned. It was also dependent on pupil availability on the particular interview day. The interviews were audio taped, transcribed and analysed using Nvivo software.

1.3.4 Observation of classroom activities

Observation of classroom use of ICT was undertaken in both schools, over a period of two days in each, with a focus on the pupils' activities and engagement with the technologies available in those classes. Whilst these sessions were selected by the schools to showcase some innovative uses of technology, they could not be claimed to be representative of the schools as a whole. However, they allowed researchers to gain greater insights into the class dynamics in relation to use of ICT and to provide a context to researchers when speaking to pupils, and in some cases raised issues to be followed up in the interviews. Subjects observed included art and design, English, ICT, information systems, French and physics.

1.3.5 The parents

In March 2006 a questionnaire was sent to the parents of all the pupils in both schools, including those whose child had left the previous summer. The parents were asked to complete the questionnaire and return it in a prepaid addressed envelope. Where a parent had more than one child in the school they were asked to complete it based on their experiences for the eldest child. The questions were designed to elicit information on the parents' views of their children's experiences using a laptop/tablet PC in AHS and the use of computers in GUHS. Thirty two questionnaires were returned from AHS, and 39 from GUHS a response rate of 47% and 28% respectively.

1.3.6 The community centre staff

Individual interviews were conducted with four community centre staff, one face to face in September 2005 (AHS), and the remaining three via telephone during May 2006.

1.3.7 The local authority

An interview was conducted with the local authority personnel in May 2006 via telephone.

1.4 Summary

- Two purpose built community high schools, Ardnamurchan High School which was a new school, and Glen Urquhart High School which was a new building, opened in August 2002 in Highland Region, as a result of active campaigning by local community members and councillors over an extended number of years. (1.1)
- The Highland Future Schools (HFS) Project funded by the Scottish Executive Education Department's (SEED), Future Learning and Teaching (FLaT) Programme (between March 2002 and March 2004), was conceived by the Local Authority Director of Education during the planning stages of the two schools. (1.1)
- The project was seen as an opportunity to provide and use technology in support of learning to enable further and better opportunities for both schools and their local communities. The important role of the school in the community is evident in the HFS project, the aim of which is to use ICT to:
 - raise achievement of school pupils;*
 - enhance school links with the wider community;*
 - increase the local skills base through home-school-community ICT partnerships.*
- The two schools were purpose built to similar designs. However, they have sought to shape their participation in the project to match their individual circumstances, and maximise the benefits to their pupils, teachers, parents and local communities. (1.1.2)
- Each school received ICT equipment, including a laptop for each member of staff to use for their own professional purposes. (1.1.2)
- In Ardnamurchan High School each pupil has been given personal use of a laptop/tablet PC. (1.1.2)
- Glen Urquhart High School received laptops, but not for personal use by pupils. They were used in classrooms as an additional resource together with existing desktop computers, and were a shared resource throughout the school. (1.1.2)
- The evaluation of the project commenced in March 2005. It has four main aims:
 - Aim 1** Assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools;
 - Aim 2** Identification of what, if any, impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment;
 - Aim 3** Assessment of the project's impact in improving home-school and community links and building partnerships with other educational/training providers;
 - Aim 4** Identification of what, if any improvements the use of ICT has made in terms of developing and delivering greater learning and teaching opportunities for teachers, pupils and adult learners. (1.2)

The evaluation project commenced in March 2005 and concluded in May 2006. As the project has been implemented differently in each school, the data from the evaluation of each school is reported separately in subsequent sections: Ardnamurchan High School (sections 2-6); and Glen Urquhart High School (sections 7-11). Section 12 discusses the local authority perspective and the Headteachers' final reflections. The final section, 13, draws together the overall findings and discusses the conclusions and recommendations from the evaluation of both schools. (1.2)

The methodology has combined quantitative and qualitative approaches in both schools. It included: a questionnaire survey of teachers, pupils and parents; semi-structured interviews with a sample of teachers and pupils; semi-structured interviews with the Headteachers, ICT coordinators; community education staff, local authority staff; and classroom observations. (1.3)

SECTION 2

ARDNAMURCHAN HIGH SCHOOL

THE SCHOOL CONTEXT, BACKGROUND INFORMATION, AND HEADTEACHER'S AND ICT COORDINATOR'S PERSPECTIVES OF THE IMPLEMENTATION OF THE PROJECT

2.1 Introduction

In this section we detail background information about Ardnamurchan High School and the introduction and implementation of the project. The data are derived from interviews with the Headteacher and ICT coordinator in May and September 2005.

2.2 The School Context and Background to the Project

Ardnamurchan High School, located in Strontian, opened in 2002 as a new six year comprehensive community high school, and is situated on a remote peninsula in the West of Scotland. It was designed to meet the needs of the Ardnamurchan and Morvern communities, and has a wide geographical catchment area which includes Kilchoan, Acharacle, Strontian, Lochaline, Ardgour and Achaphubail primary schools. An advantage for pupils from these remote and scattered communities is that they no longer have to travel long daily journeys to school. The school has a teaching staff of 16 and a pupil roll of 126 (2005-06). As a community school there are additional facilities available to the community, for example, a wide range of sporting, recreational, cultural and lifelong learning opportunities, a nursery and crèche facilities and out of school care for 4-14 year olds.

2.3 The Project Implementation and Features

2.3.1 The project aims and implementation

The school embarked on the project with three specific aims:

- 1. To raise achievement in learning and teaching through the provision of laptops/tablets to all pupils, allowing continuous access to ICT and the Internet.*
- 1. To improve home-school links and allow the community more access to and knowledge of ICT.*
- 3. To allow the small number of pupils (and parents) in the school to enjoy the benefits of a broad, balanced, varied and enriching curriculum.*

This ambitious and innovative project was seen as an opportunity to provide further and better opportunities for the school and its local community to use technology in support of learning. Initially, it aimed to provide pupils with better access to ICT resources in lessons, more opportunities to access school resources from home, and to offer families and the local community better access to wider learning opportunities. In operation the balance between these aims has changed and more emphasis has been placed on the use of technology to enhance learning, teaching and school administration, to extend the curriculum in the school, and to improve communication between home and school.

The initial aims of the project had to be reinterpreted over time for a combination of technical and network security reasons. It soon became clear that technical and security issues arising from the nature of the managed service contract under which the school's ICT infrastructure was provided, made connection to the school network from home computers impossible. Instead, the project came to focus on the wider and deeper use of ICT in the school curriculum and for administrative purposes. Ready access to ICT for pupils and staff was seen as an opportunity to increase their use of, and confidence with, ICT. The project came to be seen as an opportunity to embed ICT into the classroom and give pupils greater flexibility

and autonomy in their learning – using ICT more effectively in school and at home in support of learning and achievement.

The project has an ICT coordinator who is also the Principal Teacher of Management - ICT, and the school ICT coordinator. He has been involved in the planning of the HFS Project from August 2002. He was appointed just before the school opened and helped with planning for ICT equipment use and getting systems up and running. There is no separate project management structure as the project is embedded in the general management of the school. The Headteacher considered this to be a highly effective device for a small school which enables the project to be at the heart of developments and ensures very effective communication across the school community.

2.3.2 The project equipment

The ICT systems and equipment provided by the project includes: personal laptops or tablet PCs for all pupils and staff; interactive whiteboards and data projectors in some classes; suites of desktop machines in ICT, graphic communication, and a limited number of machines in art; a handful of wireless access points supported on 20 laptops,¹ and a broadband connection to the internet.

The project team emphasise that the equipment available is seen to be less important than the pedagogical purposes it is designed to serve. They seek to take a learning driven approach to development. As a consequence, the project evolved to contribute to the school's wider commitment to helping pupils and teachers to use ICT effectively and fully. As a forward-looking school the Headteacher indicated that AHS must look to exploit technology fully and effectively to help pupils prepare for participation in the 21st Century.

I want pupils to be able to stand favourably against anyone in the workplace and have an advantage – one advantage is to have better than average ICT skills.Pupils are not just Scottish but citizens of the world. That is why we want links with other countries - Grenada, Nova Scotia and France, for example.

Headteacher

2.4 Benefits of the Project

2.4.1 Impact of the project on the teachers

a) learning and teaching

Both the Headteacher and ICT coordinator reported increased staff confidence and competence when using ICT to support teaching and learning, with a range of expertise in the school. All the staff are involved in the project, though some to a greater degree than others. As a consequence, coverage and use in different areas of the curriculum differs from classroom to classroom. However, every department is required to have its own developmental ICT project and plan, and each department contributes to a school system of planning and reporting of progress against ICT targets.

Teachers are able to plan lessons and learning opportunities on the assumption that ICT tools will be available. Personal ownership of laptops has allowed them to develop their familiarity with ICT packages and their pedagogical uses in their own time, and at their own pace. The Headteacher indicated that many staff have reported that ICT use has increased their personal effectiveness and the efficiency of school administration.

¹ This was part of a limited pilot accepted by the managed service provider (MSP). The school was designed and built to accommodate a full wireless network, but the MSP persuaded the Council that such a network would constitute a corporate security risk and so the wireless provision was not implemented.

Teachers are becoming aware of opportunities to provide a richer curriculum by linking pupils to external subject experts and learning networks or resources.

Both the Headteacher and ICT coordinator indicated that the increased use of ICT in the school has added to its reputation and allowed it to make an enhanced contribution to the development of local and professional communities of interest. Staff members have contributed to events and initiatives such as Scottish Education and Teaching with Technology conference (SETT), a SETT event in Highland Region, an international Innovative Teachers conference and the Highland Learning Festival.

b) Assessment and administration

Regarding assessment and administration, the school has made use of electronic markbooks for staff to record results and these are collated across the school. Staff are using Excel-based worksheets, but with added programming elements. A user-friendly web interface links to the school behaviour management system, so staff can see pupil progress and behaviour patterns as they emerge. The system supports creation of standard letters to parents where necessary.

We are a small school but the quantity of information handled is immense. I cannot see a way of effectively managing that information without ICT use.

ICT Coordinator

c) Staff development

With respect to ICT training for staff, during the first year of the school, members of staff with ICT knowledge and experience delivered an intensive, customised New Opportunities Funding (NOF) programme to all staff which was regarded by the Headteacher as a great success. The decision to use an in-house training programme reflected a preference for local design and control, but was also a necessity. As the school is so remote, transport is so expensive and there is very little available money for CPD the school has to rely on in-house training. The in-house programme has continued each year and staff also consult more experienced colleagues as a source of on-going support. This has made a major contribution to raising staff morale and confidence and so has increased the motivation to use ICT for learning.

2.4.2 Impact of the project on the pupils

On joining the school in S1 the pupils responded to the challenge of being given responsibility for having a laptop.

The pupils came in and the school said – “you are special, we are giving you responsibility for £1000 worth of kit”. We have treated them with respect and the great majority have risen to this responsibility. On the whole they are very responsible.

ICT Coordinator

Ready access to their own personal laptops or tablet PCs has provided pupils with opportunities to develop and demonstrate responsibility for their own learning. The Headteacher and ICT coordinator reported that the equipment has been well looked after by the majority of pupils. Pupils take responsibility for carrying equipment between home and school.

We as a school are proud of our learning and teaching and use of ICT is a part of that. ICT is used effectively in each subject. More and more use is being made of ICT in classrooms. We are proud of our climate of mutual support by pupils and staff. For example, this can be seen in pupils helping each other with ICT. All pupils have access to hardware and this allows the flexible delivery of the curriculum. This empowers pupils - they have expensive kit which is their own responsibility – for how it's used at home and in school. There is an enriched curriculum with added

resources, very good software and good use of outside educational links are made available outside the classroom.

Headteacher

At this stage it is not possible to provide evidence that the project has had an impact on pupil attainment, although anecdotal evidence suggests that the pupils are more motivated and interested when ICT is used to support learning.

2.4.3 Impact of the project on the local community

Members of the local community have the opportunity to apply for access to the school network. Some have done so for personal use or in connection with evening classes. Others have used school internet access for special projects where high bandwidth was needed to support large file transfers. However, usage has reduced as other community opportunities have come into existence and more individuals purchase their own machines for home use. Use by parents has been supported by the school providing training drop in sessions, and through partnership with local organisations.

2.5 Barriers to the Project

The main barriers to the project identified by both the Headteacher and ICT coordinator are: the terms of the managed service contract under which the school's ICT equipment was provided and maintained, and inflexibility of the networking arrangements; recruiting and retaining sufficient technical support staff; reliability of the equipment.

2.5.1 Management service provider contract

The contract with the managed service contract precluded the possibility of linking laptops or computers used at home by pupils or parents to the internet or to the school's intranet, as a consequence of concerns over corporate network security. Solutions were investigated but none could be found that reconciled the school's aspirations and corporate network security and the available finance. No internet service provision proved possible as internet files loaded on at home could then be brought into school and might therefore compromise the integrity and security of the network. As a result as already indicated in Section 1.1.3, the home-school networking links planned initially could not be developed.

We want to empower pupils and explore limits, the managed service provider needs to limit access for security reasons - this is a fundamental conflict at the heart of the future use of systems.

ICT Coordinator

Difficulties also arose over the lack of onsite support when problems with networking arose in school and the slowness with which the network service provider responded to these problems when they occurred.

2.5.2 Recruiting and retaining technical support

It has been difficult for the school to recruit and retain technical support staff. This is seen as being crucial to the continuing success of a project of this sort. Having a huge amount of technology, but not the manpower to make sure it is working as well as it could, has been a source of frustration for the school community.

When the school opened the ICT coordinator was the only onsite support person. The school now has some limited support from their managed service provider (MSP). In the first year of the project it was allowed 0.5FTE technician support and an individual technician was appointed. Later, the Local Authority allowed a further 0.5FTE for support. Someone was then appointed, but left after four weeks. Therefore the lack of technical support continues to be a huge issue. There is a lot of 'pushing the boundaries' they would like to do in the school that they cannot do for lack of technical support. The lack of appropriately trained and

experienced technical support has held development back at crucial points in the evolution of the project, and has exacerbated problems over the reliability of equipment.

The school has had to hold back and see to basic maintenance. As an example – software management and maintenance of machines is a challenge with mobile computers. The school wanted to do ghost-imaging which allows the 'master' set-up of software programmes and related work files to be copied to each class computer on the network at the same time by an automated or semi-automated process. Instead they have had to load software onto each computer one after another and then individually configure them. It took eighteen months to get the first ghost image from their MSP. The school still does not have control over ghost-imaging which would make software management much easier.

2.5.3 Reliability of the equipment

The reliability of the equipment has also been a source of frustration for both the staff and pupils. There are a very few older pupils who have given up as the machines proved unreliable or not suited to the learning and expression mode of the individual. A couple of key issues have caused frustration. Firstly, the synchronization of 'My Documents' folders across local and network versions and associated program access can be different for reasons that are not understood. They faced and face, persistent, but unpredictable problems. Aspects of MSP service lie outwith school control, but solutions are slow in coming back from the MSP. As a result there are lots of, 'technological sticking plasters' in place. For example, using features of Corel Draw they found to be a problem, but finally solved the problem by exploring the Corel website themselves. The MSP is not familiar with many educational programs, settings and demands, and may be wary of developments such as the use of wireless networking which they see as incompatible with corporate security requirements.

A lack of user-friendly laptop connectivity in all areas of the school building has caused problems and has restricted the use of ICT. The school has no effective wireless network, although a limited pilot exercise was conducted. This pilot demonstrated clearly the importance of wireless networking of laptops to ensure that they were ready for fully flexible use in lessons. Easy use in any room is important, if use is to become a matter of routine.

Jotters and books are reliable. Technology is not always reliable. If a class of 20-30 all bring tablets and if three or four are not working the lesson is going to be disrupted. Pupils' motivation will be affected. Machines that are not working are removed by a technician and not returned for a week.

Headteacher

2.6 Summary

- Ardnamurchan High School, located in Strontian, opened in 2002 as a new six year comprehensive community high school, and is situated on a remote peninsula in the West of Scotland. The school has a teaching staff of 16, and a pupil roll of 126 (2005-06). As a community school there are additional facilities, for example, sporting, recreational, cultural and lifelong learning opportunities available to the community. (2.2)
- The school embarked on the project with three specific aims: (2.3.1)
To raise achievement in learning and teaching through the provision of laptops/tablets to all pupils, allowing continuous access to ICT and the Internet.
To improve home-school links and allow the community more access to and knowledge of ICT.
To allow the small number of pupils (and parents) in the school to enjoy the benefits of a broad, balanced, varied and enriching curriculum.
- The initial aims changed for a combination of technical and network security reasons, such that access to school resources at home was not possible. (2.3.1)
- The ICT systems and equipment provided by the project include: personal laptops or tablet PCs for all pupils and staff; interactive whiteboards and data projectors in some classes; suites of desktop machines in ICT, technology and a limited number in art, a handful of wireless access points supported on 20 laptops, and a broadband connection to the internet. (2.3.2)
- Personal ownership of laptops has allowed the teachers to develop their familiarity with ICT packages and their pedagogical uses in their own time, at their own pace. Increased staff confidence and competence when using ICT to support teaching and learning with a range of expertise in the school. (2.4.1a)
- There is an increase in the use of ICT for administration and assessment purposes, for example, the use of electronic markbooks for staff. (2.4.1b)
- An initial intensive, in-house customised NOF programme was delivered to all staff. Training has been ongoing and teachers consult more experienced colleagues. This has contributed to raising staff morale, confidence and increased motivation to use ICT for learning. (2.4.1c)
- Ready access to their own personal laptops or tablet PCs has provided pupils with opportunities to develop and demonstrate responsibility for their own learning. ICT has enriched the curriculum through added resources and access to experts outwith the classroom. Personal use of laptop/tablet PCS has enabled a more flexible delivery of the curriculum, empowering the pupils. (2.4.2)
- The terms of the managed service contract under which the school's ICT equipment was provided and maintained, and inflexibility of the networking arrangements; the robustness and reliability of the equipment; lack of an effective wireless network in the school building; and recruitment/retention of sufficient technical support staff have all acted as barriers to the project. (2.5)

SECTION 3

THE IMPACT OF THE PROJECT – THE ARDNAMURCHAN HIGH SCHOOL TEACHERS' PERSPECTIVES

3.1 The Teachers' Perspectives

3.1.1 Introduction

This section of the report addresses elements of:

- Aim 2 - the identification of what, if any, the impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment.

and

- Aim 4 - the identification of what, if any, improvements the use of ICT has made in terms of developing and delivering greater learning opportunities for teachers, pupils and adult learners.

Reporting on the perspectives of the teachers at Ardnamurchan High School, in relation to the above aims, the analysis of interview transcripts and questionnaire data reveals some overlap between the themes emerging from the two aims. In order to present a readable account that avoids repetition, this section, whilst addressing all the relevant research questions is organised around those emerging themes.

The data are derived from the interviews conducted with four teachers (chemistry, English, physics, technology) in September 2005; and questionnaire responses from fifteen teachers (94% response rate), including the senior management team, (Art & design, biology, chemistry, craft and design, English, French, Gaelic, German, history, PE, physics, mathematics, geography, graphical communication, science and RME) in March 2006.

We first describe the nature and range of uses of ICT, the impact on teaching, the ways in which ICT is used to support non-teaching activities, the teachers' ICT training needs and the barriers to their use of ICT. Finally, an account is given of the impact of ICT on the pupils' learning, attainment, achievement and motivation, and the barriers to pupils' use of ICT, specifically their use of laptop/tablet PC.

3.2 The Impact of the Project on the Teachers

3.2.1 The range of uses of ICT

Each teacher had been issued with a laptop for personal and professional use, and a laptop or tablet PC was provided for pupils' individual use.

a) Use of a laptop

Table 3.2a shows that over two thirds (67-73%) of the staff used the laptop provided for preparing learning and teaching materials at home, giving classroom presentations, maintaining class records and whole school records. Approximately a half (53-60%) also used the laptop to prepare materials in school and transfer work between locations in school.

When asked what were the two most important benefits of having the laptop, the teachers reported that its ready availability offered greater convenience and flexible working opportunities, both within school and between school and home.

Almost all (94%) of the teachers who returned a questionnaire had used their laptops at home. Twenty seven percent had used it at home three or more times a week, 47% once or twice most weeks and a further 20% occasionally when the need arose. Activities predominantly included lesson preparation, worksheets etc.

Preparing learning and teaching materials and presentations.

Table 3.2a The Teachers' Professional use of a Laptop

(percentage of questionnaire responses) (N=15)

	% who used the laptop	% who found the laptop useful for this purpose
Preparing learning and teaching materials at home	73	67
Maintaining class records for my own professional purposes	73	47
Displaying presentations in the classroom	67	60
Maintaining whole school administration records	67	40
Transferring work between locations in school	60	60
Preparing learning and teaching materials in school	53	53

b) The teachers' use of ICT

The teachers' main uses (60-100%) of ICT for professional or school-related purposes are presented in table 3.2b.

Table 3.2b The Main Uses of ICT by Teachers

(percentage of questionnaire responses) (N=15)

	This activity is well established
Writing reports	100
Exchanging email with professionals in the school	100
Exchanging email with professionals outwith the school	100
Using WWW search engine	93
Downloading material from WWW	87
Using a word processor	87
Accessing the school network	87
Visiting educational www sites e.g. LTS, BECTA, SCHOLAR or BBC	87
Creating classroom resources	80
Keeping class lists and records	80
Using automated emailing lists	73
Sharing assessment information	67
Submitting returns online	67
Creating classroom presentations	60
Using subject specific packages	60

Creating online courses, taking online CPD courses, the use of videoconferencing and exchanging emails with parents were much less well established, 20%, 13%, 13% and 7% respectively. These were aspects of ICT use that some teachers also indicated they were not thinking of introducing in the future, for example, using videoconferencing (40%), and creating online courses, 13%. With regard to exchanging emails with parents, 27% indicated it was 'beginning to happen' and 53% that they were not thinking of doing so in the future.

The interview data supported questionnaire findings. There was evidence of a range of uses of ICT, both for teaching and administrative purposes. The uses included word processing, PowerPoint, the internet, subject specific software, for example, drawing packages, data projectors and interactive whiteboards, although the latter were not available in all classrooms. Additionally there was a suite of desktop computers in two

teachers' classrooms. Inevitably there was variety in the extent of use of ICT between individual teachers which was also subject specific, for example, the use of 'data logging' software in science. Being able to prepare lessons in advance at home was considered advantageous due to lack of time in the school day. The technology teacher explained that s/he has developed her/his own website, www.AHStechology.co.uk where materials are available for anyone to use. The website includes workshops, course notes and revision notes.

3.2.2 *The impact of ICT on teaching*

a) *Impact on teaching and learning practices*

There was evidence from the questionnaire responses that teachers perceived using ICT as having a positive impact on their teaching practices (see table 3.2c). All the staff thought that using ICT had supported positive changes in their classroom practice, and 93% disagreed that ICT '*does not help me to add variety to my teaching repertoire*'. Eighty seven percent thought using ICT contributed to their professional self-image. Two thirds of the teachers (66%), also considered that using ICT had helped them to communicate better with parents.

Table 3.2c *Impact on Teaching and Learning Practices*

(percentage of questionnaire responses) (N=15)

Using ICT...	Strongly Agree/ Agree	Disagree/Strongly Disagree
Supports positive changes in my classroom practice	100	0
Does not help me to add variety to my teaching repertoire	7	93
Contributes positively to my professional self-image	87	13
*Adds interest to my classroom presentations	86	7
Can help create better homework exercises	87	13
Helps me to communicate better with parents	67	33
Effectively, adds to the professionalism of an inexperienced teacher	53	47

* includes nil response

When asked what were the two most important ways the use of ICT had impacted on their teaching, greater access to resources both for themselves and for pupils was highlighted. Additionally, ICT gave teachers the opportunity to create and edit their own materials and use more varied methods to support different learning styles.

Eighty percent of the teachers felt that the use of ICT had helped them manage teaching and learning more effectively. Examples they gave of how ICT had helped included: improved organisation and efficiency; preparation of materials and differentiation; record keeping; tracking and monitoring of pupil progress.

It has improved organisation and access to information.

Additionally, using ICT aided classroom management by having all pupils working together. The technology teacher who had a suite of desktops in his teaching room said '*a suite of desktops was hugely successful and practically faultless*'. Although ICT was thought to be a very useful tool for teaching it was emphasised that it should be used appropriately, not for the sake of it, and that it was more useful in some subjects than others.

The ICT resources or facilities that the teachers (N=15) found to be most useful for classroom purposes by 60% were: a personal laptop computer; a data projector, and

internet access, with the laptop being used fairly regularly by 53%. Sixty percent of the teachers commented on the usefulness of the laptop and data projector.

Personal laptop and data projector - for better presentation of material and efficiency.

Just over a third (40%) highlighted the usefulness of an interactive whiteboard for their teaching, and the same number indicated that they used it regularly. It was thought to be particularly useful because it allowed input from pupils. In science, specific software such as 'Chime' has enabled teachers to illustrate abstract concepts, and allowed pupils to visualise molecules and the rotation of molecular structures with much greater clarity than traditional teaching resources. Two teachers commented that they would like to have made greater use of one.

These technologies enabled teachers to give enhanced visual presentations to pupils, for example, PowerPoint slide shows which incorporated animations and video, for example, in physics, web sites showing simulations of Computerised Axial Tomography (CAT) scanning, in addition to traditional oral exposition. The production of customised materials for pupils, which could be regularly updated, was considered to be an advantage over some existing subject textbooks, which the technology teacher for example felt for her/his subject were '*fairly inadequate.*' S/he wanted the pupils to have these materials on their own laptops to carry around. This had only worked to some extent because some of the pupils' laptops/tablet PCs were broken. For these pupils s/he had to print copies '*but it is a huge amount of material for them to carry around.*' For this system to work properly the technology issues related to pupil laptops would need to be addressed, (see section 3.2.5).

b) Organisation of learning and individual teaching styles

Eighty percent of the teachers indicated that greater access to, and use of ICT had changed their teaching style. The benefits identified included the use of more visual and interactive materials, support for group work, an increase in pupil autonomy and responsibility, the use of a wider range of learning resources and the opportunity to re-use resources. One teacher explained

I have used shared resources as 'alternatives' to methods I would have taught. I can spend more time and more detail on explanations, I am not constantly having to write on the board, rub it off, write again etc..

The teachers who were interviewed were very enthusiastic about ICT and judged their teaching to have been enhanced through its use, '*I think it has changed things for the better.*' The impact of technologies is two fold: it gives a teacher the opportunity to enhance their normal teaching style and also provides opportunities to extend into innovative approaches. The technology teacher indicated that involvement in the project had radically changed his/her teaching style because of the amount of ICT s/he had in the classroom, and the amount s/he had managed to incorporate into the curriculum.

c) Innovative use

When asked about the most innovative uses made of ICT for learning and teaching, the teachers made reference to PowerPoint, subject specific software or functions available on the interactive whiteboard.

I have built a departmental website that includes 100s of Powerpoint lessons, videos, interactive quizzes, and worksheets.

Continuously used for design, therefore everything is innovative or should be in my subject.

The school has developed the intranet so that PowerPoint slideshows and other teaching materials have been put on it for pupils to access from their own laptop/tablet PC, or any networked computer. Some members of staff have developed 'scoring' PowerPoint software which has proved valuable in tracking pupils' progress. This allows teachers to insert questions onto the PowerPoint slides for the pupil to respond to. The pupil is then given feedback in terms of how s/he has done. This software also allows the teacher (invisible to the pupils) to see how many times a pupil attempted a question before it was answered correctly, and the total amount of time taken to complete the work. This facility allows teachers to identify pupils who are struggling with a particular question, and gives the opportunity to provide additional help.

d) Impact on the curriculum

Two thirds (67%) thought that using ICT had some impact on providing additional learning opportunities or extending the curriculum. For example,

- e-mail links to schools overseas;
- removal of barriers to learning (e.g. literacy difficulties);
- research activities to add relevance to mathematics lessons and opportunities to explore topics in depth;
- opportunities to create differentiated materials;
- use of self-assessment software and Scholar materials to help pupils take responsibility for their own learning.

The internet has provided an enriched curriculum in that it has enabled teachers to access key resources and information from specific curriculum websites. For example, in physics, the teachers used web sites showing ultra-sound scans and also 3-dimensional ultra-sound images instead of using sources from a textbook. It was reported that the internet has now enabled an online Gaelic Medium geography course to be delivered by a Gaelic teacher, who is not a geography expert.

3.2.3 The teachers' administrative uses

Responses to the questionnaire showed that the use of ICT for administrative purposes was well established (see table 3.2.b). All (100%) were using it to write reports and 80% for record keeping, with a further 13% indicating the latter was beginning to happen. Sixty seven percent shared assessment information, and for a further 20% it was beginning to happen or be introduced in the next one to two years. The data also confirms that teachers were positive about the use of ICT in support of administrative tasks. Over 90% indicated ICT helped them to track pupil progress and make school administration more efficient, and for 87% it increased their personal efficiency. This is exemplified by one teacher who states:

ICT useful for record keeping, managing information, accessing whole-school information etc.

The qualitative accounts supported the questionnaire data. The teachers used the laptop for a range of administrative purposes: electronic markbooks for recording pupil grades and the tracking of pupils' progress; pupil reports; attendance records. These are accessed on the school server together with the daily bulletin which appears automatically on all machines when staff log in. This was thought by teachers to bring considerable advantages as one indicated, '*certainly in terms of record keeping, planning, I think it is brilliant, and in general administration as well.*' Additionally, a computerised data system was used by all staff to support the school's behaviour management strategies, '*our behaviour management system is a logging system which is based on Access.*'

3.2.4 Staff Development

As already indicated in section 2.4.1, two teachers with ICT knowledge and experience had been involved in the design and delivery of the in-house, customised NOF training for the staff. Those who had participated in the training felt had been very helpful and using ICT is '*almost second nature to me now.*' One teacher listed a range of on-going training opportunities in which s/he had taken part, the most recent being the new Excel mark book the previous week. This teacher particularly highlighted the support of the ICT coordinator, which together with the support of the technician, was '*excellent*'. The ICT co-ordinator is, s/he said, '*always two or three steps beyond me all the time.*' If s/he (this teacher) was struggling s/he felt able to go and ask for help, '*and there are very few things he has not been able to help me*'. S/he felt that the school was very fortunate because '*if that one man was not here this would a completely different story. He is just so enthusiastic and so capable.*'

Questionnaire returns confirmed that teachers generally appreciated the part ICT could play in supporting their CPD and the ICT-related support they had received. The practical and 'hands-on' character of ICT training sessions offered in the school, and the attentiveness of in-house trainers were acknowledged and welcome. Examples of well-received training opportunities included:

- Front page for web site creation
- Digital video and editing
- NOF training
- ECDL
- Introduction to interactive white board

Of those who responded to the questionnaire, 100% (N=15) indicated they used e-mail for professional exchanges with others outside of school. Sixty percent had either participated or were beginning to participate in online discussion groups. One in four teachers had taken a CPD course online or was beginning to get involved in this activity. Approximately half (47%) expected that they would do so in the next one to two years, and only 13% were not yet thinking about this possibility. One teacher's comments illustrate the importance of the training and staff development offered to the teachers.

There is something on tomorrow night. It is ongoing. At the start we did a huge amount of training. I knew nothing about Front page. Nothing about databases, practically nothing about Excel. That's all been in-house. I have also had training on Moviemaker which was great. They have been very good in that line.

The teachers felt that their ICT skill level improved over the duration of the project with a change from 27 % rating themselves as very competent or competent before the project, to 73% at the time the teachers responded to the questionnaire. Only two teachers indicated that lack of ICT knowledge or skill was a barrier to their participation in the project. Further training needs the staff identified were using: Front Page; interactive whiteboards; Macromedia; and ongoing support for those who considered themselves to be less confident users.

3.2.5 The barriers to teachers' use

The barriers have already been documented in section 2.5, and focused on: access to the school network from outwith the school; lack of user-friendly laptop connectivity in all areas of the school building; the robustness of the ICT equipment both for staff and pupils; getting software onto the machines; securing a sufficient level of technical support. With respect to the latter, the teachers thought the ICT support staff within the school were doing a good job allowing for the resources they had. However, due to the number of machines for the technical staff to deal with, there were delays at the beginning of each year for all pupils receiving a fully operational laptop/tablet. There were also delays in dealing with ensuing

hardware problems so that it could be many months before a pupil had a laptop/tablet returned to them. One problem highlighted by the teachers in terms of them planning lessons with the whole-class use of laptops, was that they could not rely on all the pupils having a fully functioning laptop with them in class.

I don't think there is ever going to be a day when the class has a full set of operating laptops. Those who have them may well use them but they cause problems with the constant need for things to be fixed. I feel ICT is essential to my curriculum, but I often need to rely heavily on fixed PCs in addition to laptops.

However, even when the majority of pupils did have their laptops functioning, a downside was the time it took for all the machines to load up and be fully operational. In these circumstances teachers often preferred to access teaching rooms which had a suite of desktops. The technical teacher explained

pupils can get down to work very quickly with the desktops, whereas the laptops will take up to ten minutes to get ready

He further explained that other subject teachers used his room (which had a suite of desktop machines) when it was available because they knew the desktop PCs had greater reliability than the laptops.

I think just because they know that these machines will work and there won't be any problems. There won't be batteries that haven't been charged. People that have forgotten their power leads,... these things work.

A further problem for pupils, and thus the teachers, was the loss of completed work on the laptops. Inevitably some pupils had attempted to take advantage of this problem.

A few of the most switched on pupils had clicked onto the fact that they don't have to do their work, come to school and then claim it was there yesterday. We sometimes have a bit of trouble with that.

Questionnaire data confirms that a large majority of teachers (87%) indicated that they had encountered difficulties that had inhibited their greater use of ICT, with the 73% reporting they encountered problems/frustration when using the laptop. Technical reliability problems were most commonly mentioned, including: pupils logging on to the network which was slow and unreliable; poor performance of tablet PC's; and network crashes or unavailability. Consequently the classroom management of laptops and tablets was identified as a problem, and the routine of regular use was not fully established. The unreliability of the pupils' laptop/tablet PCs, that pupils may not have them ready fully charged, or may not bring them to the class, acted as a barrier to the teacher's planned use with the class.

Not all pupils have laptops, some have had theirs withdrawn for various reasons, others are broken. So it is very difficult to set a whole class experience on laptops – invariably 20% of the class don't have their laptop.

The power and functionality of the school network also featured in questionnaire returns. The lack of a functional wireless network was identified as a major barrier to laptop use. Inability to implement Class server or Share point services made the network less manageable. However, only two teachers indicated that their lack of ICT knowledge or skill was a barrier to their participation.

3.3 The Impact of the Project on the Pupils

3.3.1 The pupils' use of ICT

The school's vision of being a 21st Century school, with ICT embedded in teaching and learning has meant that the pupils:

take it for granted. The technology is embedded and it's just part of what they see school is aboutthough some of the kids have taken to the resources better than others, on the whole we have a very ICT literate pupil community.

Table 3.3a highlights the main uses of ICT by pupils as reported by the teachers. The most frequently reported uses were: internet use, both for accessing information and downloading material; word processing; accessing the school network and use of a video camera. Approximately half (53%) of the teachers reported that they used databases or spreadsheets for their own professional use, but they do not appear to be so commonly (20%) used by the pupils.

Table 3.3a The Pupils' Use of ICT - reported by the Teachers
(percentage of questionnaire responses) (N=15)

	Pupil use of ICT
Using WWW search engine	47
Using a word processor	47
Downloading material from WWW	47
Visiting educational www sites e.g. LTS, BECTA, SCHOLAR or BBC	40
Accessing the school network	40
Using a video camera	40
Creating or editing graphics	33
Using stills digital camera	33
Creating classroom presentations	33
Using subject specific packages	33
Using databases or spreadsheets	20

All the four teachers interviewed were enthusiastic about the potential for pupil use of ICT and reiterated the above findings. They identified a range of pupils' use of ICT resources, and variety of software packages specific to the particular subjects, including word processing, PowerPoint, interactive packages and quizzes, data logging and drawing packages, the internet for curriculum websites identified by the teacher, as well as pupils searching for information themselves.

One teacher felt that the most positive aspect for pupils is that they themselves have easy access to key resources. For example, from a curriculum point of view s/he used Virtual Higher Physics, produced by a company that has set up a range of physics software. S/he taught from the whiteboard and the pupils have their own versions in front of them. Section 3.2.1 highlights a similar pupil use, where materials produced by the technology teacher are available on the pupils' own laptops.

3.3.2 The impact of ICT on learning

a) Positive Aspects

Teachers thought the use of ICT had a positive impact on learning and the learners. For example, 94% disagreed with the statement '*Using ICT does not contribute positively to the learning of my pupils*', suggesting they think using ICT does make a positive contribution to pupils' learning. They were evenly divided as to whether ICT should be used for part of most lessons, with 47% agreeing and 53% disagreeing.

All those responding agreed that using ICT can provide access to revision materials for pupils, the majority (86%) agreed it helped to create better homework exercises and helped parents to support homework (80%).

When asked what were the two most important benefits the pupils had gained as learners through the use of ICT, responses included becoming more confident, self-reliant, independent learners, improved ICT skills and knowledge of specific packages, better understanding of scientific concepts and developing transferable skills. Two thirds (67%) of the teachers also indicated ICT had enabled them to provide additional learning opportunities or an extended curriculum.

Similar to the impact on teaching, data from the teacher interviews suggests that in addition to enhancing the presentation of work and producing a different form of output, for example, PowerPoint presentations, the use of ICT has the potential to fundamentally alter the way pupils learn. Examples of enhancement of learning included: the use of the virtual to experience the practical, easy access to key resources for pupils, an aid to revision, opportunities for pupils to learn independently, and resources better targeted to different styles of learning.

An ICT rich curriculum allowed pupils to access key resources for themselves. For example, in science, when pupils conducted an experiment that involved data logging, they were able to use their own laptop/tablet PCs to load the software, run the data logging experiment and get the results for themselves. This allowed the teacher to step back as s/he no longer needed to demonstrate the experiment. The teacher judged this to actively encourage pupils to take ownership of their own learning:

They can play with it, it's on their own laptops, they can keep their own data, they can analyse their own results later. I think that's a hugely empowering benefit to science teaching.

Equally, s/he thought that having subject specific software readily available on their laptop/tablet PCs allowed pupils to simulate experiments for revision purposes, which would not have been possible to do in the time available in the classroom.

It's interactive, there are little tests, there are little simulations to play with and try out. This is especially useful from a revision perspective when you don't have time to get apparatus out again, you can re-enter the virtual environment.

The use of virtual software also provided a means by which pupils were able to extract summaries of key points or an experimental set-up from the software, instead of taking up time writing out laborious notes. Previously pupils had only kept an online version of their notes, but the teacher now gets the pupils to print it out, selectively cut and paste into their jotter and highlight key points. By doing this, the pupils were more engaged and it aided the learning process and their revision.

Other fundamental changes in learning could be seen in the way ICT allowed greater flexibility in communicating the curriculum, so that it could be more targeted to individual learning styles. The DHT highlighted a teaching and learning forum in the school, a group of staff working on multiple intelligence theory and looking at preferred learning styles. As a consequence of training offered to staff, they can help pupils to identify their own learning styles. ICT was considered to be particularly helpful for visual learners, *'they can learn better by seeing pictures.'* The use of colour and moving images on a screen benefits visual learners in ways that traditional black and white text does not.

It's not the be all and end all and you can't do away with other traditional learning and teaching methods. However, by making use of what ICT has to offer I think you widen the net of the kids that you reach.

It was considered that ICT had helped a significant proportion of all pupils. It provided online extension materials for the faster learners, and a pupil with dyslexia had made heavy use of ICT. *'It has made him clearly communicative through his ICT skills and XX has done very, very well. So I think ICT has helped him, I think it has helped him hugely'.*

b) Negative Aspects

With regard to the negative aspects of ICT use, 40% thought it was too unreliable to be used routinely in classes, although 53% disagreed. Almost half (47%) thought that using ICT detracted from pupils' learning, mainly because time was often 'wasted' in lessons for pupils. This was either due to the unreliability of laptop/tablet PCs, logging-in or other distractions, particularly when using the internet. For the teachers themselves, the unreliability of the pupil laptop/tablet PCs, that they may not be charged, or that the pupils may not bring them to class, acted as a barrier to their use in class.

Impact on attainment, achievement and motivation

The questionnaire responses (Table 3.3b) indicated that either all, or the majority, of teachers thought the use of ICT had a positive impact on pupils' motivation, self-esteem, enthusiasm, engagement with learning and attainment.

Table 3.3b The Teachers' Perception of the Impact of ICT on Pupils' Attainment, Motivation and Self-esteem

(percentage of questionnaire responses) (N=15)

Using ICT	Strongly Agree/Agree	Strongly Disagree/Disagree
Motivates most pupils	100	0
Extensively reduces pupils enthusiasm for learning	0	100
* Does not increase pupils' self-esteem	0	100
Allows pupils to develop greater independence	93	7
* Improves boys' engagement with learning	87	7
Leads to raised attainment for many pupils	80	20
* Improves girls' engagement with learning	67	27

* includes nil response

However, whilst one of the project aims includes an aspiration that the use of ICT would raise attainment and achievement, the teachers who were interviewed felt unable to provide any hard indicators demonstrating the effect of ICT on attainment. They did however, see gains in pupil motivation, engagement with learning, confidence enhanced pupil learning. One teacher thought that although the use of ICT would have a significant impact on attainment for some pupils, it would not, perhaps for the majority. What ICT did achieve for pupils was to add value by giving the pupils a broader, more enjoyable learning experience with lifelong benefits.

But they are still going to come out of it with the same piece of paper and probably pretty much the same qualification. They will probably be better more rounded, more employable students.

a) Engagement with learning

The notion of ICT as a factor in improving attainment was felt to be complex, since it depended on the pupils' level of engagement with learning, willingness to work and *'the quality of the teacher and teaching, and the quality of the learning.'* However ICT did make it easier for teachers to engage the pupils. S/he felt if ICT was taken away:

I guarantee the school would still function, and there would still be good learning and good attainment. So what does the ICT do? It makes our job as teachers easier, and it makes it easier to engage the learners – so it does have an impact on attainment.

ICT was viewed as an important factor in motivating and engaging pupils with learning compared to using traditional learning materials/methods. One teacher talking about revision with Higher pupils said, *'they work away on that. You give them a page of questions or text book work to do, they will not work as well.'* However, one teacher was unsure about the effect of ICT on motivation and talked about the variation between individual pupils, *'some pupils are motivated and others unfortunately are not.'*

b) Self esteem

With every pupil in the school having a laptop or tablet PC, one teacher reported it was difficult to judge the extent to which it had raised their self esteem, *'everybody in the school has one, so how much self esteem you can get from something that everybody else has got in your little world, I don't know'*. Another teacher emphasised that using ICT aided pupils in the presentation of their work. So although it was difficult to judge the impact of ICT in raising pupils' self esteem and confidence, s/he thought that the ability to produce a very *'professional and pretty finished product, I think that does inspire confidence rather than a scribbled piece.'* The downside of the technology was the impact on pupils when there was equipment failure, *'as long as it works that's great but once they break it, I think their confidence and self esteem is affected.'* Table 3.3b however, suggests that despite their uncertainty with regard to the impact of ICT on self esteem, all the teachers who completed a questionnaire believe it has a positive impact.

c) Presentation of work

As indicated above the use of ICT aided the presentation of the pupils' work, *'which is markedly improved.'* However, the English teacher highlighted his/her concern that the use of computers all the time might affect the pupils' general literacy. Because of this s/he indicated *'I always get them to do first drafts with a pencil and final drafts on the computer.'* However, s/he was considering changing this practice after recommendation from a recent HMIE inspection visit to the school that computers are being used increasingly as a composition tool.

3.3.4 Gender differences

The teachers interviewed suggested that it was difficult to see any real differences between boys and girls in their engagement with ICT, although they expressed a range of views. One teacher thought that boys were slightly more engaged than girls, *'maybe 55 to 60 percent more than the girls'*. However s/he also commented on the level of interest in ICT shown by girls, *'how many of them are quite happy to go on the computer and get on with things. Some of the work they have done has been tremendous, the girls in particular.'* Another comment highlighted that although there was very little difference in ICT competence between boys and girls, the girls tended to take more care and make fewer mistakes. Questionnaire data (see Table 3.3b) however, suggests that teachers believed that using ICT has a greater impact on boys' engagement with learning (87%), than girls' engagement with learning (67%).

3.3.5 Age and stage differences

Regarding differences in the pupils' attitudes towards using the laptops, amongst the teachers who were interviewed, there was a range of opinions. One teacher commented that the younger pupils were enthusiastic because it was a novelty to have their own laptop as some did not have access at home. Another teacher pointed out that the younger pupils and senior pupils were *'certainly more enthusiastic about the computers'*, but that the third and fourth year pupils tended to be *'a bit blasé about things'* and were not quite so keen on using ICT.'

3.3.6 *The barriers to pupils' use of laptop/tablet PCs*

Due to the technological difficulties detailed in section 2.5.1, pupils could not access the school intranet on their laptop/tablet PC at home. Additionally, the main barrier to the pupils' use of their laptop/tablet PC in school was its unavailability when not functioning properly and being repaired. A further problem already highlighted in section 3.2.5 was the poor filing of work from laptop/tablet PCs, and the time taken to load up the machines and log into the school network.

The teachers highlight in their questionnaire responses some disadvantages for the pupils of having an individual laptop/tablet PC, which can act as a barrier to the pupils' use of ICT. Of the fifteen teachers who returned a questionnaire, six suggested that pupils do not like carrying them around because they are too heavy, and four teachers indicated the lack of network/wireless connections in classroom. Other barriers to use focused on the pupils themselves and their need to take responsibility for the laptop/tablet PC. Four teachers noted that pupils often forgot to bring laptops to the class or left them at home, with three indicating that some pupils were not responsible enough in looking after them.

The school had conducted its own research into the health and safety implications of pupils carrying a laptop/tablet around. One teacher mentioned the perceived view of pupils whether they had a laptop or tablet, was that both were heavy in addition to carrying books and other equipment around.

3.4 Summary

- Each teacher was provided with a laptop for their individual use, over two thirds (67-73%) used it for preparing learning and teaching materials at home, giving classroom presentations, and maintaining class records and whole school records, and 94% used it at home. (3.2.1)
- Teachers perceived using ICT as having a positive impact on their teaching practices. ICT had: supported positive changes in their classroom practice (100%); contributed to their professional self-image (87%); helped them manage teaching and learning more effectively (80%); and had helped them to communicate better with parents (67%). (3.2.2)
- All teachers had exchanged emails with professionals in school and outwith school; sixty percent had either participated or were beginning to participate in online discussion groups; and one in four teachers had taken a CPD course online. (3.2.1/4)
- The ICT resources or facilities that the teachers found to be most useful for classroom purposes were a personal laptop computer (60%), a data projector (60%), internet access (60%) and interactive whiteboard (40%), with the laptop being used fairly regularly by 53% of teachers. (3.2.2a)
- 80% of the teachers indicated that greater access to, and the use of ICT had changed their teaching style. The benefits included: the use of more visual and interactive materials and access to key resources; support for group work; an increase in pupil autonomy and responsibility; and the use and re-use of a wider range of learning resources. (3.2.2b)
- The teachers felt that their ICT skill level improved over the duration of the project with 27 % rating themselves as very competent or competent before the project, to 73% at the time the teachers responded to the questionnaire. Further training needs identified included using: Front Page; interactive whiteboards; and ongoing support for those who considered themselves to be less confident users. (3.2.4)
- Barriers to teachers' use included: not being able to access the school network from outwith the school; lack of user-friendly laptop connectivity and of a functional wireless network in the school building, the robustness of the ICT equipment both for staff and pupils; and securing a sufficient level of technical support. (3.2.5)
- Teachers considered the use of ICT had a positive impact on learning and the learners. The most important benefits the pupils had gained as learners through the use of ICT included: becoming more confident, self-reliant, independent learners; improved ICT skills and knowledge of specific packages; better understanding of scientific concepts; and developing transferable skills. (3.3.2)
- All, or the majority, of teachers thought the use of ICT had a positive impact on pupils' motivation, self-esteem, enthusiasm, engagement with learning and attainment. However the four teachers who were interviewed felt unable to provide any hard indicators demonstrating the effect of ICT on attainment. (3.3.3)
- Barriers to the pupils' use of a laptop/tablet PC included: not being able to access the school intranet on their laptop/tablet PC at home; the lack of network/wireless connections in the classroom; the robustness of the laptops/tablet PCs for use in school, and the time taken to repair them if they break down; and not liking carrying their personal laptops/tablet PCs because they are too heavy. (3.3.6)

SECTION 4

THE IMPACT OF THE PROJECT – THE ARDNAMURCHAN HIGH SCHOOL PUPILS' PERSPECTIVES

4.1 Introduction

The aim of project as far as the school was concerned was *To raise achievement in learning and teaching through the provision of laptops/tablets to all pupils, allowing continuous access to ICT and the Internet.* The current S5 cohort (2006-07) was the first year group of pupils to be given a laptop when they joined the newly opened school as S1 pupils in 2002. Pupil feedback to the school identified issues such as the heavy weight of the laptop and specific damage, for example at its corners, partly due to the insufficiently padded and poorly designed backpacks. Subsequently the following year the school gave incoming S1 pupils, and any others who joined the school, a tablet PC, which was much lighter and with an interactive pen, which proved to be more attractive to pupils. However, although there was less damage overall to tablet PCs, faults consistently occurred, for example, the keyboards cracked and they were much slower than the laptops. The school has since reverted to giving laptops to incoming pupils, and therefore the current S6 pupils have a mixture of laptops and tablets, S5 have laptops, S4 and S3 have tablet PCs, and S2 and S1 pupils have laptops.

Here we present data from the pupil questionnaire that focused on pupils' use of ICT, at school and at home, via their own personal laptop/tablet PC, together with data from interviews conducted with a sample of S4, S5 and S6 pupils in September 2005. The pupils, including S5 and S6 school leavers, completed the questionnaire in May and June 2005. The current S5 year group (2006-07), is the cohort who first received the laptops. They were in S3 when they completed the questionnaire, and in S4 when interviewed.

Caution should be taken in interpreting the data, as the majority of questions on pupils' use of ICT in school focused principally on their use of a laptop/tablet PC. The sample size of S5/S6 is also extremely small. From earlier indications (Sections 2.5.3 and 3.2.5), we are aware that pupils were not always able to maximise the opportunities that laptop/tablet PCs can offer. However, the pupils were making extensive use of ICT via desktop machines in some curricular areas.

We present here the data from the pupils (N=80), a 64% return rate, of whom 50% are male and 50% are female pupils. For a more detailed breakdown of the data for years S1/S2, S3/S4 and S5/S6, see Appendices 1-4.

4.2 The Impact of the Project on the Pupils

There was evidence of a wide range of skills at all stages, but at the time of completing the questionnaire inevitably younger pupils had less experience of using the laptop/tablet PCs compared to the more senior pupils. We were interested to know their perceived level of competence of ICT after having the use of laptops/tablets during the project. Approximately one third (35%) of all the pupils in the school thought that they knew 'a lot/I'm a real expert', with 64% indicating they knew 'enough to get by' about computers.

4.2.1 The frequency of laptop/tablet use

In the questionnaire we asked the pupils to estimate how often they used the laptop/tablet PC in school each week. The most common pattern of use was once or twice per week by almost half of the pupils (43%), with 16% using it three or four times per week, and 5% using it every day. The figure of 16% for the whole school conceals a pattern of highest use in S1/S2 and S5/S6, with approximately one quarter of the pupils from these year groups using the laptop/tablet PCs three or four times a week, compared to only 6% in S3/S4. As indicated in section 4.1, pupils may have used a desktop machine and during the interviews some pupils

indicated a preference to do this, mainly due to the laptop/tablet PC taking a long time (up to ten minutes) to load and be ready to use, (see section 4.3.2).

Another factor in the pupils' frequency of use was that it was controlled by the teacher. Also, as reported in section 3.2.5, if the laptop/tablet PCs were frequently not working or took a long time to load, this was off-putting for the teacher. In future lessons the teacher would either ask the pupils to use desktop machines, if available, or decide not to use ICT at all. The use of ICT also depended on the topic studied and whether it was appropriate to use.

4.2.2 Specific uses of ICT

The data in table 4.2.2 (Appendix 1) indicate a high level of pupil use of ICT. Over 80% of the pupils used their laptop/tablet PC to word process; search for information on the internet; make PowerPoint slides and play music. Other frequently used applications by over half of the pupils (53%-71%) indicate a wide variety of use: drawing/designing, emailing friends, spreadsheets, databases, creating web pages and multimedia presentations, making animations etc.

4.2.3 Differences across curricular areas

There were discernable differences in patterns of pupil use in different curricular areas. We asked pupils to indicate if they had used either a laptop/tablet or desktop PC in each of the subjects during the previous week. We are aware that this is not necessarily indicative of the level of general use of ICT by the pupils, compared to asking about pupils its use throughout the school year. However, it does provide a snapshot picture, although we acknowledge it may simply reflect which particular subject topics happened to be studied during the census week.

Table 4.2.3a The level of computer use by the S1-S6 pupils

(*These figures show the % of that sub sample of pupils who actually took the subject the previous week).

Think about the subjects you studied last week			
	N = 80	N = 80	N = 80
	% who had this subject last week	* % who used a tablet/laptop in this subject last week	* % who used a desktop in this subject last week
English	98	38	39
Mathematics	96	20	3
French	75	24	23
Art and Design	59	6	40
Information Technology	56	11	54
Music	73	13	14
RE/RME	50	31	0

Regular use of ICT (tablet/laptop or desktop) tends to be in subjects which particularly lend themselves to project type work in which pupils can be required to seek out and use information from electronic sources e.g. English, religious education, social subjects; or to use programmes particularly designed for that subject, for example, technology, art and design, science. The most frequent uses indicated to us are shown in the above table 4.2.3a: English and ICT, followed by French and art and design.

It is less straightforward to present the data for years S1-S6 in one table as above, for those subjects which are taught together in S1/S2 and then as discrete subjects in later school years. For example: science (biology, chemistry and physics at S4-S6); technical (practical craft skills/craft and design, graphical communication, admin. at S4-S6); social subjects (geography, history at S4-S6). This is due to being unable to simply total the data for each

year group. However, table 4.2.3b (Appendix 2) shows the frequency of use of ICT (both tablet/laptop or desktop) by pupils in these curricular areas in the different year groups.

4.3 Advantages of the Pupils' Involvement in the Project

4.3.1 Impact on Learning

The data from the pupil questionnaire (table 4.3.1, and Appendix 3) indicate that there were a number of benefits gained by pupils through using ICT, and specifically the laptop/tablet PC. It provided access to resources, for example the internet (63%), and allowed pupils to find information that they claimed to be not available in books (80%); improved ICT skills (79%) and flexibility of use. Approximately three quarters of the pupils (73%) indicated they could use their machine to continue their school work at home and show their parents their work, thus meeting one of the key aims of the project. Equally, the machines allowed pupils to continue working outwith lesson times in school, for example lunchtime (71%).

Table 4.3.1 The Positive Aspects of laptop/tablet PC Use
(percentage of questionnaire responses)

What I like about using the laptops/ tablets in school	Agree a lot/ Agree			
	S1/S2 N=43	S3/S4 N=33	S5/S6 N=4	S1-S6 N=80
I can find information that I cannot find in books.	81	76	100	80
I can save my work in a safe place.	81	82	25	79
I am learning a lot about how to use a computer.	79	70	25	73
I can easily continue my school work at home.	84	61	50	73
I can show my work at home.	81	67	25	73
I can continue my work at lunchtimes.	77	67	50	71
I get to use the Internet during lessons.	68	58	50	63
I get to use my own ideas.	72	42	25	58
It helps me to do better at school work.	63	49	25	55
It has helped me to learn or understand more in some subjects.	61	39	75	53

The use of the laptop/tablet PC as a personalised learning tool was indicated by approximately half of the pupils (58%), agreeing with the statement '*I get to use my own ideas.*' In assessing the impact of the laptop/tablet PC on the pupils' skills and understanding, over half of the pupils (see table 4.3.1) said it had helped them to learn and understand better in some curricular subjects (53%) and to do better at their school work (55%). This view was reiterated by the pupils during the interviews.

Interviewer: Do you think using the laptops has helped you to learn any better in any of your subjects? '*I would say that in some subjects definitely, I would say so*'.

The teachers' use of ICT resources, such as an interactive white board, was generally thought by pupils to enhance the presentation of curriculum materials due to the clarity of typed text, compared to the teacher's use of a traditional black board. They claimed this helped their understanding.

ICT in classes is definitely better because it's a lot more clearer and you can understand a lot of things.

It's easier to read the writing because it's typed

S5 Pupils

Equally, an interactive white board enabled pupils to see what the teacher was presenting directly on their own laptop/tablet PC. *They (the teachers) would put it on their computer then fire it on the smart board, so the whole class can see instead of gathering round a desk.*

A more intrinsic benefit of ICT was seen to be in their future lives. One pupil thought the school had prepared them well for work in this aspect.

It (the laptop) teaches you a lot more about ICT and because you are more getting into the futuristic scene you've got most jobs require computing skills and you do learn a lot on the computers.

S5 Pupil

4.3.2 Impact on attainment, achievement and motivation

a) engagement with learning

With respect to motivation, two thirds of the pupils (66%) thought that school work was more interesting as a consequence of using the laptop/tablet PC, and around a half (58%) thought it was fun using a laptop (Appendix 3). Half of the pupils considered that a major advantage of having the machine was its availability to use for social/entertainment purposes, for example, playing games, listening to music and watching DVDs.

b) Presentation of work

The questionnaire data (Appendix 3) indicate that the majority of all the pupils (88%) claimed that the laptop/tablet PC was a useful tool in aiding their presentation of work by making it easier to edit and look neater.

I prefer the laptops because typing I'm a faster typer than at writing, my writing can be really messy sometimes so I would rather do it on the computer.

S5 Pupil

Overall, the findings were supported in the responses to the open question 'What for you were the two best things about being involved in the laptop project?' Pupils valued having a machine for their own use, being able to continue work at home, present neater work, type instead of having to write, and doing work they thought to be more exciting and/or interesting.

It's helpful if you have not finished the essay because you have been off, or whatever, and you get to type them up at home - useful for doing drafts and changing it.

S4 Pupil

4.4 Disadvantages of the Pupils' Involvement in the Project

The problems identified most frequently by the pupils from the questionnaire data (table 4.4, Appendix 4) were: the heaviness of the laptop/tablet PC and having to carry it around all day regardless of the anticipated use (74%); inability to link it to their home computer (73%); and its fragility, unreliability and the technical problems which they encountered from its use (61%) – breaking down too easily (56%), and having to frequently charge the battery (55%). Approximately half, (49%) of the pupils were worried about having responsibility for an expensive piece of equipment, and a very small number during interview appeared to resent having to take this responsibility. A very small minority (6%) indicated they had no one to go to for help if they had a problem with the machine.

Table 4.4 The Negative Aspects of laptop/tablet PC Use
(percentage of questionnaire responses)

What I don't like about using the laptops/ tablets in school	Agree a lot/ Agree			
	S1/S2 N=43	S3/S4 N=33	S5/S6 N=4	S1-S6 N=80
The Tablet/Laptop PC is too heavy to carry around.	63	94	25	74
The Tablet/Laptop PC doesn't link up easily with the computer I use at home.	77	70	50	73
There are too many technical problems.	49	76	75	61
The Tablet/Laptop PC breaks down too easily.	51	61	75	56
I have to charge the Tablet/Laptop PC too often.	56	55	50	55
I worry that I might break something so expensive.	56	39	50	49
The programs on the Tablet/Laptop PC are not as good as the ones on the computer at home.	51	52	0	49
I don't get to use the Tablet/Laptop PC in school often enough.	42	52	25	45
The Tablet/Laptop PC does not work reliably with the school network.	44	43	50	44
The teacher doesn't let us try things out for ourselves.	37	49	0	32

These findings were supported in the responses to the open question 'What for you were the two worst things about using the laptop or desktop PCs in school?', and the pupil interviews. Additionally they also mentioned being unable to access the internet at home; the laptop/tablet PCs taking too long to fire-up/load in lessons and wasting time; being unable to download files and losing files; and insufficient memory to save their work.

Nearly half of the pupils (45%) thought they did not get to use their laptop/tablet PC as frequently as they would like. Table 4.4 shows this view was most prevalent in S3/S4, (52%), with the S3 pupils being the first year group who received the laptops, and who have had the longest use of the machines. A much smaller number of S5/S6 pupils, (25%), held this view, and when interviewed some of the pupils indicated the teacher gave them a choice of using their laptop/tablet or not. The interview data also supported the pupils' view that they did not use them very frequently in some subjects. One pupil pointed out that the use of ICT required teachers to look at different ways of teaching and learning, rather than just using ICT as a tool:

I think the teacher should actually accept that the curriculum will have to change, slightly adapted to the laptop, because there is no point in having them. It is just like 100 laptops and they hardly get used, to be honest.

When asked what advice they would give to other schools considering giving pupils a laptop/tablet PC, some of the S4/S5/S6 pupils who were interviewed recommended that it would be better if the laptop/tablet PCs were only allocated to the older pupils. These pupils thought that in the lower school years, pupils were inclined to take less care of the laptop/tablet PCs, and use them less frequently than in S5/S6, when pupils were given more personal choice when to use them. Others suggested that due to lack of frequent use the money would be better used for other resources for the school, for example, a mini bus, sports equipment or books etc.

4.5 The Pupils' Use of ICT Outside of School

With regard to access to computers outside of school, the majority of the pupils (80%), indicated they had a computer at home, and 73% of them were able to access the internet at home. Seventy eight percent used a home computer in addition to using their laptop/tablet PC. We asked the pupils to estimate how often outside of school they used the laptop/tablet PC or home computer for school-work each week. The most common pattern of use was once or twice per week, (36%). Only four percent used it three or four times per week.

In addition to using their laptop/tablet PC to complete homework, pupils also used it and a home owned computer for social or entertainment purposes. The most frequently reported activities were playing music CDs, playing DVDs and sending/reading emails (using the home computer).

4.6 Summary

- All pupils in the school were issued with either a laptop or a tablet PC. The questionnaire data presented are from 80 pupils, a 64% return rate, of whom 50% are male and 50% are female pupils. (4.1)
- Approximately one third of pupils indicated that they knew 'a lot/I'm a real expert', with 64% indicating they 'knew enough to get by' about computers. (4.2)
- 43% of pupils reported using the laptop/tablet once or twice a week, 16% reported three or four times a week and only 5% used it on a daily basis. The highest use was found in S1/S2, and in S5/S6. Low usage of laptops/tablets in some case was ascribed to the pupil's preference for desktops. However, the teachers' frustration with slow loading of laptops and tablets also reduced their use. (4.2.1)
- Over 80% of pupils used laptop/tablet PCs for the following functions: to word process, make internet searches, design PowerPoint presentations and play music. Other frequently used applications by over half of the pupils included drawing/designing, emailing, spreadsheets, databases, creating web pages and multimedia presentations. (4.2.2)
- A snapshot picture of ICT use in different subjects in the previous week revealed that use was highest in those subjects that lend themselves to internet based research, e.g. English, RME and social subjects, or in those subjects for which specific software packages can enhance performance e.g. technology, art and design, and science. (4.2.3)
- Around three quarters of pupils appreciated the advantage of being able to continue work at home or at school outwith lesson times. Over half the pupils acknowledged the use of the laptop/tablet as a personalised learning tool by their positive response to the statement *I get to use my own ideas*. Over half felt the laptop/tablet had helped them to learn and understand better in some curricular areas (53%) and to do better at school work (55%). Pupils also identified the benefits of staff use of ICT to make clearer presentations. (4.3.1)
- 66% claimed school work was more interesting as a consequence of laptop/tablet use, and 88% claimed the laptop/tablet was a useful tool for aiding presentation and editing of work. (4.3.2)
- Pupils' negative responses focussed on practical issues such as the heaviness, fragility and unreliability of the laptop/tablet PCs, and their inability to link to their home computers. 49% were worried by the responsibility for such an expensive piece of equipment. Delays caused by slow loading during lessons were a source of frustration. Interview and questionnaire data suggested that the laptop/tablet PCs were not in very frequent use, and 45% of pupils would have liked to use them more often. (4.4)
- 80% of pupils had access to computers at home, with 73% having access to the internet. 36% of pupils used computers at home for school work once or twice a week, and only 4% used it more frequently than this. In addition to school work, home use included social and entertainment activities, such as playing music CDs, playing DVDs and on the home computer, sending/reading emails. (4.5)

SECTION 5

THE IMPACT OF THE PROJECT – THE ARDNAMURCHAN HIGH SCHOOL PARENTS' PERSPECTIVES

5.1 Introduction

This section addresses two main themes: parental views of the benefits of the project to pupil motivation, achievement, teaching and learning in the school (Aim 2), and the impact of the project on improving home-school links (Aim 3). Some parents were also community users of the facilities in the school, and although data about community use was gathered during parental interviews this is reported separately in section 6 which focuses on community use of the facilities, including ICT.

Data from parents were collected by means of six semi-structured telephone interviews which were followed by a questionnaire survey. The interviewees were drawn from a self-selected sample of parents who indicated their willingness to participate in response to a letter sent to them. The development of a short (two page) tightly structured questionnaire was informed by these interviews and was issued to all parents in March 2006. Thirty two parents responded (47% return). Approximately one third (33%) of the responses were from parents of S4 pupils, the cohort who had used the laptop/tablet PCs for the longest period. The remaining responses were predominantly from parents of S2 and S3 pupils (both at 25% of the sample). Of the thirty two parents, 84% (N=27) had a computer or laptop at home. Of these, 63% (N=17) used it on a daily basis with the remaining third using it several days or once/twice per week. Sixty six percent described themselves as fairly/very experienced computer users.

5.2 The Benefits of the Project on the Pupils

The parental responses in relation to the pupils' opportunities to use ICT show they were positively disposed towards the project. Table 5.2 shows that 75% of questionnaire respondents strongly agreed/agreed that the project 'overall has been of benefit to my child' and the school ICT facilities 'helped my child learn about computers'. Seventy eight percent thought that the project had not only helped their pupils with ICT skills, but had 'helped my child to learn in other ways.' They unanimously (100%) concurred that it was important that their child learnt about computers at school. However, approximately one third, 37%, felt that they would like their child to have used computers more often at school (compared to 44% who had no view, and 19% who disagreed with this statement). Whilst parents were clearly keen that their children become adept at computer use, and felt this had been achieved, they were less certain about the impact of ICT on their children's education more generally.

With regard to engagement with learning, almost half of the parents (44%) thought that using a laptop/tablet PC had helped to motivate their child to learn, and 40% agreed that its use had improved their child's performance at school (44% had no view and 16% disagreed). However, 37% agreed with the statement that using computers had *not* made their child more interested in school-work (compared to 28% who disagreed).

All six parents interviewed expressed specific enthusiasm for the project and general support for the use of ICT. All indicated that they were very supportive of the school's promotion of ICT. They expressed the view that confidence and competence with ICT is important for all young people and they believed that having regular access to personal laptop/tablet PCs had developed these qualities in their own children. All said that their children were very familiar and comfortable using ICT, and as parents they often looked to their children for support and advice when using ICT in the home. One expressed the view, typical of many, that using computers was, 'second nature' to their children.

Table 5.2 The Parents' Views on Pupil Learning

(percentage of questionnaire responses) N=32

How much do you agree with the following statements? NB the term 'computers' includes laptops and/or tablet PCs.	Strongly agree/ Agree	No view either way	Strongly disagree/ Disagree
I think it is important that my child learns to use computers at school.	100	0	0
Having the additional computers in school has helped my child learn in other ways .	78	9	13
Overall I think the HFS project has been of benefit to my child.	75	22	3
Having the additional ICT resources in school provided by the HFS project has helped my child learn about computers .	75	22	3
Using computers has motivated my child to learn.	44	34	22
Using computers in school has improved my child's performance at school.	40	44	16
I think my child should use computers more often in school.	37	44	19
*Using computers has not made my child more interested in their school work.	37	31	28

* includes nil response

In addition to the immediate benefits of ICT use, much of the enthusiasm for their children's perceived competence at computer use was linked to the extensive use of ICT in the workplace and in modern life generally, and the role of the school in preparing the pupils for this. This was evident both in interviews and in their responses to the open ended questions in the questionnaire, when asked what the benefits of having a laptop/tablet PC for personal use were for their child.

Majority of jobs require people to be computer literate nowadays. (Parent 1)

The HFS project has given my child more confidence and skill in the use of this technology. (Parent 2)

Access to research information for projects. (Parent 3)

He is more creative with his work. (Parent 4)

5.3 The Pupils' Individual Use of the Laptop and Tablet PCs

Table 5.3 shows that parents were fairly evenly divided on some issues relating to their child's personal use of the laptop/tablet PCs. Forty one percent of questionnaire respondents agreed that their child found the laptop more of a burden than an asset, which slightly outweighed the 38% who disagreed. Forty seven percent disagreed that their child was now less enthusiastic about using his/her laptop/tablet PC compared to when s/he first received it, compared to 41% who agreed.

Forty seven percent indicated there were disadvantages for their child using a laptop/tablet PC. When asked to describe what these were, the most frequently mentioned responses (N=11) related to its heavy weight and carrying it around.

Carrying laptop to and from school (heavy and fragile). (Parent 5)

This view was supported by all of the parents interviewed who expressed concern that the laptop/tablet PC was very heavy to carry, especially along with the many books and materials that were also required on a daily basis, and too fragile to be transported around with such frequency.

Table 5.3 The Parents' Views on the Individual Use of the Laptop and Tablet PCs
(% of questionnaire responses) (N=32)

How much do you agree with the following statements? NB the term 'computers' includes laptops and/or tablet PCs.	Strongly agree/Agree	No view either way	Strongly disagree/Disagree
*My child has found the laptop/tablet PC more of a burden than an asset.	41	12	38
*My child is now less enthusiastic about using his/her laptop/tablet PC compared to when s/he first received it.	41	9	47
My child has not used his/her laptop/tablet PC as frequently as I expected in school .	34	44	22

* includes nil response

Additionally, individual parental responses reflected the frustrations expressed by other users of the unreliability of the laptop/tablet PC, and that in some cases it impeded rather than enhanced progress in class. However, when asked what future developments they would like to see, several parents (N=5) expressed the hope that more frequent use would be made of the laptop/tablet PCs, both to extend the pupils' current use and knowledge of specific software, for example, graphic design and web design, and to give pupils further ICT training to improve their skills and knowledge when they were no longer taking ICT as a class subject after S2.

5.4 Home-School Links

As already documented earlier (section 2.3.1) it proved impossible for the school to fulfil its original aims of improving home-school links by enabling pupils to access work from the school intranet at home and for parents to see their work. However, although 51% of parents (table 5.4) indicated that their child had not used his/her laptop/tablet PC as frequently as they had expected at home, six parents reported in the responses to the open questions on the opportunities that personal use had brought for their child. It had enabled them to continue school-work at home and also helped to ease the pressure on users' competing access to the home computer.

It is of great benefit as we do not own a computer at home.

Able to use computer when home one out of action. Able to access school info/files from home.

Free up time on home computer.

The use of the new technology to enhance the links between home and school did not appear to have been a particularly high priority for parents, but there was some evidence of an impact of ICT. Parents' involvement and knowledge of their children's school work did appear to be enhanced in some cases, with 53% of parents responding that they had opportunities to see their child's schoolwork through the use of the home computer. Almost a half of parents (47%) thought they were more aware of their child's work through his/her use of a laptop/tablet PC. However, this was qualified by comments in interviews and responses to

the open questions, to the effect that the difficulties of incompatibility and transfer of materials from home to school in some cases hampered this link.

In terms of information transfer between parents and the school, the website appeared to be well used by parents, 69% of whom had accessed information about the school from the website. Other forms of electronic communication were at an earlier stage of development and less frequently used, but nonetheless 38% of parents had received emails from the school and 19% had sent emails to school.

Table 5.4 The Parents' Views on Communication and Information Exchange between School and Home

(% of questionnaire responses) (N=32)

How much do you agree with the following statements? NB the term 'computers' includes laptops and/or tablet PCs.	Strongly agree/ Agree	No view either way	Strongly disagree/ Disagree
*I can access information about the school, e.g. the curriculum, events, via the school website .	69	6	19
My child has not used his/her laptop/tablet PC as frequently as I expected at home .	51	22	28
I am now more aware of the work my child does through his/her use of a laptop/tablet PC at home.	47	25	28
*The school sometimes communicates with me via email .	38	6	50
*I sometimes communicate with the school and/or teachers via email .	19	6	66

* includes nil response

5.5 Summary

- Twenty seven of the thirty two (84%) of the questionnaire respondents had a computer or laptop at home, 63% used it on a daily basis with the remaining third using it several days or once/twice per week. Sixty six per cent of parents described themselves as fairly/very experienced computer users. (5.1)
- All questionnaire respondents strongly agreed/agreed that it is important that their child learns to use computers at school, 78% that it had helped their child learn in other ways, and 75% that overall the project had been of benefit to their child and having additional ICT resources had helped their child learn about computers. (5.2)
- Whilst parents were clearly keen that their children become adept at computer use, and felt this had been achieved, they were less certain about the impact of ICT on their children's education more generally. (5.2)
- All parents interviewed expressed specific enthusiasm for the project and general support for the use of ICT, and indicated that an important benefit of ICT use was preparation for the workplace. (5.2)
- With regard to engagement with learning, almost half of the parents (44%) thought that using a laptop/tablet PC had helped to motivate their child to learn, and 40% agreed that its use had improved their child's performance at school (44% had no view and 16% disagreed). However, 37% agreed with the statement that using computers had *not* made their child more interested in school-work (compared to 28% who disagreed).
- Parents were fairly evenly divided on some issues relating to their child's personal use of the laptop/tablet PCs, with 41% of questionnaire respondents agreeing their child found the laptop more of a burden than an asset, but 47% disagreed that their child was now less enthusiastic about using his/her laptop/tablet PC than when s/he first received it. (5.3)
- Forty seven percent indicated there were disadvantages for their child using a laptop/tablet PC. The most frequently mentioned responses (N=11), related to its heavy weight and carrying it around. All parents interviewed expressed concern that the laptop/tablet PC was heavy to carry around school, with the other books/materials needed for daily use, and responses reflected the frustrations expressed by other users over the unreliability of the laptop/tablet PC. (5.3)
- Fifty three percent of parents had seen their child's schoolwork through the use of computers at home, and 47% felt they were more aware of their child's work through his/her use of a laptop/tablet PC, but this was hampered in some cases by difficulties of incompatibility and transfer of materials between home and school. (5.4)
- Sixty nine percent of parents had accessed information about the school from the school website, 38% had received emails from the school, and 19% had sent emails to the school. (5.4)

SECTION 6

THE IMPACT OF THE PROJECT ON ADULT LEARNING PROVISION – THE PERSPECTIVES OF THE ARNAMURCHAN COMMUNITY CENTRE STAFF AND USERS

6.1 Introduction

This section of the report addresses elements of:

- Aim 3 - The assessment of the project's impact in improving community links and building partnerships with other educational/training providers.
- and
- Aim 4 - the identification of what, if any, improvements the use of ICT has made in terms of developing and delivering greater learning opportunities for teachers, pupils and adult learners.

The data are derived from the interviews conducted with adult learning staff: the Centre Coordinator in September 2005 (face to face) and the Learning Centre Manager in May 2006 (via telephone); and email communication with one centre user in June 2006. The data also include the responses from parents of school pupils in the parent questionnaire in March 2006).

Firstly the role of the centre staff and adult learning activities provided are detailed. The impact of these activities are discussed from the centre staff and users' perspectives. The section then discusses the barriers to the project and factors which facilitated the success of the project. It concludes with suggestions for potential areas of expansion of adult learning provision, and advice to other local authorities considering setting up a similar initiative.

6.2 The Community Centre Provision and Staff

The provision of adult courses at the community centre has focused on leisure and learning opportunities for adults living in the wide geographical area served by the centre. When the new school and community centre building opened in August 2002 the centre coordinator was responsible for both areas of provision. He was initially employed for two years through a joint local authority and FE college partnership arrangement. However, when the contract ended he was employed full time by the local authority due to the increasing demands of that element of his remit. The centre coordinator's role has focused on managing the venue and promoting an active arts programme, for example concerts, theatre, film club etc. in addition to setting up and managing a variety of community learning and leisure courses (see section 6.3.1a).

Subsequently the local FE college appointed a learning centre manager who acts as a conduit for adult learners wanting to access further (FE) and higher education (HE) learning opportunities via distance learning courses. He offers study skills support for students and facilitates the provision of courses that support the work of local businesses. Similar to the centre coordinator, he is responsible for overseeing adult education provision in more than one location in the wide geographical area.

It's (my role) to provide a doorway into further and higher education for local people. That's how I see it and I also try and generate a bit more interest in the community. At the same time I share an office with part of the Sunart Oakwoods Initiative... and they also do quite a lot of on the ground training aspect of it from here.

The community centre has a steering committee on which the Headteacher sits and there are regular meetings between the Headteacher and community centre staff. Hence there is close collaboration and co-operation between the school and community centre staff. Both

community centre staff felt that the centre is still in a relatively new situation, and is thus finding its way, adapting and being responsive to needs of the community. It has sought to identify the local demand and then to facilitate provision of this.

6.3 The Impact on Learners

6.3.1 *The centre coordinator and learning centre managers' perspectives*

One of the main benefits of the project is that it has provided more local FE learning opportunities and a gateway to HE for members of the community. The building acts as a central venue for the region so that events, for example, theatre productions can take place.

a) ICT and other community learning provision

An important aim of the project was to allow the community more access to, and the opportunity to improve their knowledge of, ICT. Both the centre coordinator and learning centre manager judged this had been successful. They had facilitated the provision of courses in response to demands from users, with the centre providing courses which enabled adults to learn how to use a computer and gain ICT skills. The ICT courses provided have included beginners' courses for users learning how to use computers and European Computer Driving Licence (ECDL) modules. Previous to this there was no local provision.

There was a very good take up, about 12 – 15 folk in each course..... These are people who had not used computers at all before and if the Centre had not been here, probably would never have had the opportunity.

The learning centre has laptops available for students' use in its office. Additional laptops can be made available to students for use, but there are no dedicated computers for community use. There are additional ICT facilities for all community users, for example, the provision of computers with internet and email access in the centre library. This has proved popular and according to the community centre staff they are always in great demand. The computers are regularly used by people in the community who do not wish to purchase their own computer.

Adult learners use the school computers for ICT classes, however due to security concerns this has not been without problems. Adult learners have access to the community area of the server but to ensure network security, they have to log in to the server using passwords provided by the school. There are limitations in the use of the server, for example, students following a PC Passport course are not allowed to save their work onto floppy discs. Although they receive tuition and support for any problems, the work they do in the centre has to be repeated at home as they cannot take it away with them. The centre is looking at ways of solving this problem with the school.

In addition to ICT, other learning opportunities offered to community users include art classes and languages – Gaelic and Spanish. These are primarily in the evening and to facilitate community access, the centre secured funding for transport (bus) for evening class users. However, this is used primarily by youth club users as their number have increased whilst the demand for beginners' classes for learning how to use a computer have decreased as learners have progressed. Leisure opportunities for adults include sports facilities and clubs, for example, badminton, yoga, circuit training and shinty. The centre also provides childcare, and a Gaelic mother and toddler group. Where access to school resources, for example, workshops are required, wood skills courses take place at weekend because the evening class sessions are not long enough.

b) Further and higher education opportunities

The physical presence of the community centre with its ICT facilities in the locality, together with the adult learning facilitators' assistance has developed and delivered greater learning opportunities for adults. It provides ICT resources and support, for example, access to online tutorials which were previously unavailable to FE and HE adult distance learners. At the time of interview there were four students undertaking courses, including a BA degree in Child and Youth Studies, Rural Development Studies, an HND Computing, and a CISCO Engineering course with the UHI Millennium Institute (UHI) or local FE college. Whilst most students have their own computers at home, they regularly use the video conferencing facility (located within the school part of the building) to join in lectures, discussions etc with students from other locations. If students are encountering any problems they know that support via the centre is available. The provision of ICT resources was viewed by students as a stepping stone to improve their educational qualifications. An HND student hoped to progress to a higher degree in the following year.

With regard to the impact of the project in building partnerships with other educational/training providers, the learning centre manager has responded to community needs by initiating courses to support local businesses, for example, tourism. These are delivered locally by tutors from an independent training company, which shares the same building facilities as the local FE college. The certificated courses provided by the training company which support the tourist industry include kitchen management, basic food hygiene, first aid etc., and have enabled businesses to provide a more highly skilled local workforce. Other partnerships include 'Lantra' with which the FE college shares an office. One of this organisation's roles is to support businesses by providing training courses for employees in the tree and timber industry thus providing skills for the local economy.

6.3.2 The users' perspectives - parents and adult learners

Only a quarter (N=8) of parents indicated in the questionnaire that either they themselves or a family member had used the school/community centre computers, or undertaken courses learning how to use computers. These included a beginners' course for PC Passport, Publisher, and an e-book keeping course. When asked if there were any further courses they would like to be provided, four parents indicated an interest in undertaking specific software training at either intermediate or more advanced level, for example, Photoshop, digital imaging, Sage accounting. It was pointed out by two parents that they lived too far away from the centre to attend courses and would prefer to study a course via distance learning. Two parents indicated their satisfaction with current provision.

I think that the centre provides excellent facilities either through the UHI or the public library service.

Present facilities are good.

An HND student thought that the current classes available at the centre were well advertised/publicised and that a wide range of courses were offered.

6.4 Barriers to the Project

The difficulties in providing adult learning opportunities for the local community focus on three issues: technical, user-friendliness and location of provision.

6.4.1 Technical Issues

As already indicated in section 6.3.1a, the community's use of computers for ICT courses is dependent on the school computers and this has caused limitations for users. Additionally, the few college computers/laptops were originally on a different logical network system

(UHI), to the school computers which are on the local authority network, but were on the same physical network managed by the MSP. There were thus two sets of firewalls, and this caused difficulty for students accessing the courses on the 'Learn Direct' and UHI websites. Over a period of a couple of years trying to ensure the compatibility of the systems, considerable costs and time delays were incurred by the college in their attempt to solve the problem with the assistance of the managed service provider. It was felt that compatibility should have been in place at the outset. The above mentioned problems which resulted in restrictions on internet use at the Centre caused one student to be unable to access particular software, 'Netmeetings'. This resulted in missing all the 'Netmeetings' for his/her particular course until mid January 2006. However, this issue has now been resolved by the college through the installation of the broadband connection thereby separating the network.

6.4.2 Security/user-friendliness of the building

The Centre Coordinator and Learning Centre Manager thought that some potential learners were prevented from 'dropping in' to see what opportunities/resources were on offer, because they perceived they were entering a 'formal' school setting. This is because the community centre facility shares the same building as the school. Due to increased school security measures post-Dunblane, adults who attend day-time classes when the school is open are required to sign in and wear badges. This is also perceived to be less user-friendly for adult learners during the day. The layout of the building means adults are limited to evening and weekend use of some facilities which are located within the school (except for school holidays). For example, the fitness suite is next to the games hall and the pupils' changing rooms, and entry is restricted to this area due to security measures. To help adult users find their way around, it is the intention to improve the signage within the building.

6.4.3 Location

The centre has provided evening classes previously only accessible via travelling a considerable distance to Fort William. However, for some adults living in very remote locations access to learning provision at the centre incurs a long journey, for example thirty miles. Equally, due to unavailability of employment locally, some potential community users are only resident at weekends and hence are not able to participate in evening classes provided during the week.

6.5 Facilitating Factors in the Success of the Project

The availability of ICT resources within the centre has enabled users to access courses which due to their living in such a remote geographic location, would not have otherwise been possible. For example, the videoconference facilities have provided a vital means of communication for learners with their tutors and learners in other parts of Scotland, so they have not had to travel a long journey to daytime or evening classes to Fort William. This view is reiterated by a learner studying with the college, who had found videoconferencing the most useful ICT resource.

Has made remote learning an enjoyable experience, being able to meet the other people on my course and keeps me in touch with the tutors.

Student

Additionally the provision of a childcare worker post has enabled the centre to run a crèche to allow adults to attend classes or arts events, as and when required.

We have got a new child care supervisor in place, one member of staff post to do occasional crèches so if there is arts events on or training courses or a conference we can deliver child care to support it.

Centre Staff Member

6.6 Potential Areas for Further Development

6.6.1 Community centre staff

Whilst the centre staff had been very responsive to community needs in terms of organising classes and providing a gateway to the UHI Millennium Institute or other learning providers, they thought that there was potential for developing work in the community from both an environmental and local heritage aspect. This is beginning to be developed, for example, using the school facilities during the summer months to offer short courses/tutorials on aspects of environment studies and art, of relevance to the local community.

With the larger numbers of school leavers in 5th and 6th year in the future, the centre would like to offer learning opportunities, for example, vocational qualifications for those not going to university. In particular, this would assist those who have no access to private transport to the nearest FE provider, and ensure local provision for the community. Previously the only option has been for young people to leave the locality if they want to go to further education. There is also potential for exploring the possibility to act as a learning centre for the Open University.

In summing up, it was felt that the location of the centre within the particular geographic location has made facilities much more accessible community users than they were previously accustomed to. This has provided important benefits both now and in the long term for users. However, the arrival of such facilities required a familiarisation period for the community and a 'bedding-in' process. *'I think people are still getting used to the idea that there is something there, that things can happen but it's slowly happening.'*

6.6.2 Community centre users

With regard to additional ICT resources or facilities, an individual parent commented that a loan facility for computers and the associated hardware would be helpful to members of the community, particularly the elderly, or those on low income. This would enable them to try it out before purchasing it. One student also thought the community centre would benefit from having more up-to-date equipment.

6.7 Advice to Others

When asked to give advice to other local authorities and schools who might be considering similar joint school/community learning facilities, community centre staff suggested greater forethought should be given at the planning stage to the layout of the building taking into account the community users' needs and easy access as well as the school's needs. For example, whilst the aim would be for full community integration, it was recommended that the centre have its own separate entrance for community users, to facilitate easy daytime use during school hours.

Consideration also needed to be given to ensuring equal access to ICT for both school and community users, either through either a single firewall, or separate firewalls that were compatible without great expenditure being required to ensure this arrangement.

6.8 Summary

- The provision of adult courses at the community centre has focused on leisure and learning opportunities for adults living in the wide geographical area served by the centre. The centre coordinator's role is to manage the venue and promote an active arts programme and setting up and managing a variety of community learning and leisure courses (6.2)
- The learning centre manager supports adult learners wanting to access FE and HE learning opportunities via distance learning courses; offers study skills support for students; and facilitates the provision of courses that support the work of local businesses. (6.2)
- There is close collaboration and co-operation between the school and community centre staff, and there are regular meetings between the Headteacher and community centre staff. (6.2)
- The project has been successful in providing the community with more access to, and the opportunity to improve their knowledge of, ICT. Courses include beginners' courses for users learning how to use computers and European Computer Driving Licence (ECDL) modules. Previous to this there was no local provision. (6.3.1a)
- Adult learners, following for example, a PC Passport course in the centre are not allowed to save their work onto floppy discs due to security concerns, so their work has to be repeated at home. The centre is looking at ways of solving this problem with the school. (6.3.1a)
- The community centre is providing for adults, access to online tutorials which were previously unavailable to FE and HE adult distance learners. (6.3.1b)
- Partnerships have been built up with other learning providers to deliver courses to support other businesses. (6.3.1b)
- A quarter (N=8) of parents indicated in the questionnaire that either they themselves or a family member had used the school/community centre computers, or undertaken courses on how to use computers, and some requested specific software training for example, Photoshop, digital imaging. (6.3.2)
- The difficulties in providing adult learning opportunities for the local community focus on three issues: technical, user-friendliness and location of provision. (6.4)
- Facilitating factors in the success of the project included: the availability of ICT resources within the centre, and the provision of a childcare worker post has enabled the centre to run a crèche. (6.5)
- Areas for further development include: offering vocational learning opportunities for larger numbers of school leavers (5th and 6th years); and developing work in the community from an environmental or local heritage aspect. (6.6)
- Advice to other local authorities includes the need at the planning stages to give consideration to the layout of the building taking into account the community users' needs, and ease of access, as well as the school's needs. (6.7)

SECTION 7

GLEN URQUHART HIGH SCHOOL

THE SCHOOL CONTEXT, BACKGROUND INFORMATION, AND ICT COORDINATOR'S PERSPECTIVES OF IMPLEMENTATION OF THE PROJECT

7.1 Introduction

In this section we detail background information about Glen Urquhart High School and the introduction and implementation of the project. During the period of the evaluation of the project, there has been an Acting Headteacher and a newly appointed Headteacher in August 2005. For purposes of continuity the data are derived from the interviews with the ICT coordinator undertaken in May 2005, and again in September 2005.

7.2 The School Context and Background to the Project

Glen Urquhart High School, a six-year comprehensive secondary school with a teaching staff of 23, and pupil roll of approximately 230 pupils (2005-06), is located in the semi-remote setting of Drumnadrochit. The new school building opened in August 2002 providing a purpose built learning environment for a wide catchment area ranging from Cannich in the West to Fort Augustus and Dalchreichart in the South-West. The new school replaced the previous school building which was built in 1877 and had been used for secondary education since 1893. As a community school it provides additional facilities available to the community similar to Ardnamurchan High School. The new building has allowed ICT provision to be considered at the planning stages so that for example a computer network was installed which had not been available in the old building. The school prospectus for 2005-2006 highlights the use of ICT as a focus area for development:

Indeed at this new and exciting time in the life of Glen Urquhart High School staff and pupils are engaged in developing new ways in which the use of ICT (Information Communications Technology) can enhance all aspects of learning and teaching.²

And

The ICT facilities in the new school have enormously opened up the scope of IT use for our pupils and the community. It is possible to offer a greater range of Computing courses to pupils/students of all ages and abilities.³

7.3 The Project Implementation and Features

7.3.1 The project aims and implementation

The school embarked on the HFS project with four key aims:

1. *To create a local learning and communications web across all areas of the local communities served by the school.*
2. *To establish multi-agency partnerships with education and training providers to create greater opportunities for students.*
3. *To develop a learning-centre culture at GUHS to help improve school-home community links.*
4. *To raise achievement amongst pupils through their involvement with the project.*

The HFS project provided similar financial provision for ICT to both of the project schools. However, the funding was used to purchase different items of equipment in Glen Urquhart High School. Although laptops were included they were distributed to selected departments, predominantly ICT and technology, and used in classrooms as an additional shared resource for pupils throughout the school together with existing desktop computers. The ICT

² Glen Urquhart High School Prospectus available online at: http://www.highlandschools-virtualib.org.uk/school_info/handbooks4/Glenurquhart%20HS.pdf

³ *ibid*

coordinator highlighted that the project has therefore very much been an embedded part of the overall ICT provision at the school. It has not been seen as a separate, discrete project but rather that any additional ICT facilities enabled through the project have become part of the total ICT provision within the school.

Similar to Ardnamurchan High School, the aim of improving school-home links has not proved possible in Glen Urquhart High School due to the technical difficulties of allowing pupils and the staff external access to the school network from home.

The ICT coordinator, the Principal Teacher of Information Technology, was appointed after the planning phase of the project and has responsibility for the implementation of the project as part of the overall ICT responsibility for the school.

7.3.2 The project equipment

As indicated above in section 7.3.1, the laptops purchased have been used in classes as networked desktop computers. The short time-life of batteries in the laptops necessitated linking the laptops to power sockets, which in turn placed restrictions on where a laptop could be situated within a classroom. The school has a total of 148 computers including a personal laptop for each teacher and a computer ratio of approximately 2:1 for the pupils. Additional resources provided by the project include data projectors, speakers and associated software and peripherals.

7.4 Benefits of the Project

7.4.1 Impact of the project on the teachers

a) learning and teaching

Most of the staff have participated in the project through their use of ICT across a range of the curricular areas, for example music, PE and English. There have been an increasing number of requests from teachers for resources, for example, data projectors, as they become more comfortable using ICT. The success of the project has been the ongoing integration of the use of ICT throughout the school, including the integration of interactive whiteboards and data projectors for teaching. Teachers are beginning to make more use of their laptops linked to data projectors for teaching purposes. The school plans to have data projectors available in every classroom so that teachers can make more use of online resources that will be available through the Scottish Schools Digital Network (SSDN). Fewer staff have taken up the opportunity to use interactive whiteboards for teaching purposes. The ongoing use of ICT for teaching has been impeded by the staff's frustration with technical problems, (see section 7.5).

b) Assessment and administration

Teachers now use their laptops for administrative duties such as report writing. Some staff, the senior management team, guidance and learning support staff, make more routine use of the Phoenix database system for administration purposes than others, for example, learning support staff use this for pupil records of individual educational programmes.

c) Staff development

ICT training has been provided by in-house staff development within the school. The staff are also encouraged to undertake the *PC Passport* course to develop their ICT skills. Mostly, they have learned themselves as the project has progressed. New developments and examples of use are highlighted through the staff bulletin and at staff meetings.

7.4.2 Impact of the project on the pupils

As a result of having additional ICT resources, most pupils now have good ICT skills and are considered to be 'comfortable' using computers. The core ICT course in S1 and S2 has provided opportunities for pupils to use their skills in other subjects, for example, PowerPoint in English. Pupils have been encouraged to use the internet with the school directing them to more educational sites. Pupils, notably from the senior school, have the option to borrow a flash drive from the school in order to transfer their work between school and home.

At this stage the coordinator thought it is not possible to provide evidence that the project has had a direct impact on pupil attainment, although pupils are more motivated and keen to use ICT.

7.4.3 Impact of the project on the local community

Access by the wider community has not been as high as was initially hoped. This is in part due to the technical difficulties of allowing external access to the school network. Pupils have not been able to log in to the school network from home. ICT facilities are available for use within the library which is a community resource. Other community uses include, for example, the provision of classes during the school day for adult learners and links made in the school web site to community education classes.

7.5 Barriers to the Project

Similar to Ardnamurchan High School as explained in section 2.5, the home-school networking links initially planned were not possible due to the managed service provider not allowing pupils' access to school's intranet at home.

The other main barriers to the project have been technical problems which have had a negative impact on staff using ICT. For example, there were problems with file synchronisation between the laptops and the school network which caused difficulties in preparing pupil reports and some staff used alternative ways of transferring files between home and school such as storing files on a flash drive. Other problems, for example, hardware failure have meant that some facilities have not been available for a number of weeks. On occasions it has taken up to three weeks for internet problems to be resolved during which time staff do not have access to email.

The ICT coordinator expressed concern about the considerable cost of replacing the computers with newer models when required and suggested that a rental scheme might be more appropriate.

We are seriously starting to think about the future and getting these computers replaced. Because that's the amount of warranty run out and we are getting hardware faults. And that's starting to cost money which it never has before, because they were covered.

PT Information Technology/ICT Coordinator

7.6 Summary

- Glen Urquhart High School, located in the semi-remote setting of Drumnadrochit, opened in 2002 as a new six year comprehensive community high school. The school has a teaching staff of 23, and pupil roll of just over 230 (2005-06). As a community school it provides additional facilities available to the community similar to Ardnamurchan High School. (7.2)
- The school embarked on the HFS project with four key aims: (7.3)
 - To create a local learning and communications web across all areas of the local communities served by the school.*
 - To establish multi-agency partnerships with education and training providers to create greater opportunities for students.*
 - To develop a learning-centre culture at GUHS to help improve school-home community links.*
 - To raise achievement amongst pupils through their involvement with the project.*
- Laptops supplied to the school were distributed to selected departments, predominantly ICT and technology, and used as networked desktop computers in computer suites. Additionally a few (two or three), are in classrooms as an additional shared resource for pupils throughout the school together with existing desktop computers. The project is not seen as a separate, discrete project but has been an embedded part of the overall ICT provision at the school. (7.3.1)
- Each teacher was given a laptop for their own use for professional purposes. Additional resources provided by the project include data projectors, speakers and associated software and peripherals. (7.3.2)
- Most staff have participated in the project across a range of the curricular areas. They are beginning to make more use of their laptops linked to data projectors for teaching purposes. Limited use so far of interactive whiteboards for teaching purposes. (7.4.1a)
- Staff use laptops for administrative duties, such as report writing; some staff make routine use of the Phoenix database system for administration. (7.4.1b)
- ICT training has been provided by school in-house staff development. The staff are also encouraged to undertake the *PC Passport* course to develop their ICT skills. (7.4.1c)
- As a result of additional ICT resources, most pupils now have good ICT skills and are considered to be 'comfortable' using computers. There are increased opportunities for pupils to use a variety of software, for example, PowerPoint in English, and to use the internet for curriculum websites. (7.4.2)
- The terms of the managed service contract under which the school's ICT equipment was provided and maintained, and inflexibility of the networking arrangements; problems with file synchronisation between the laptops and the school network; and time taken to resolve problems (hardware and software) have all acted as barriers to the project. (7.5)

SECTION 8

THE IMPACT OF THE PROJECT – THE GLEN URQUHART HIGH SCHOOL TEACHERS' PERSPECTIVES

8.1 The Teachers' Perspectives

8.1.1 Introduction

In a similar vein to the report on Ardnamurchan High School this section of the report addresses elements of:

- Aim 2 - the identification of what, if any, the impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment.

and

- Aim 4 - the identification of what, if any, improvements the use of ICT has made in terms of developing and delivering greater learning opportunities for teachers, pupils and adult learners.

Reporting on the perspectives of the teachers at Glen Urquhart High School, in relation to the above aims, the analysis of interview transcripts and questionnaire data reveals some overlap between the themes emerging from the two aims. In order to present a readable account that avoids repetition, this section, whilst addressing all the relevant research questions is organised around those emerging themes.

The data are derived from interviews conducted with seven teachers (chemistry, computing, geography, mathematics, modern languages, PE, support for learning) in October 2005; and the questionnaire responses from ten teachers (44% response rate), including the senior management team, (art & design, computing, geography, maths, modern languages, PE, RME) in March 2006.

We first describe the nature and range of uses of ICT, the impact on teaching, the ways in which ICT is used to support non-teaching activities, the teachers' ICT training needs and the barriers to their use of ICT. Finally, an account is given of the impact of ICT on the pupils' learning, attainment, achievement and motivation, and the barriers to pupils' use of ICT.

8.2 The Impact of the Project on the Teachers

8.2.1 The range of uses of ICT

Each teacher had been issued with a laptop for personal and professional use. There was evidence of a range of uses of ICT by the teachers, both for teaching and administrative purposes. The laptops provided for pupils' use have been integrated into computer suites together with existing desktop computers. Having a small number of designated computer suites for simultaneous whole class use, together with two or three laptops per teaching room, put limitations on the ways the computers could be incorporated into some subject lessons. Computer use either had to be whole-class, or limited use within one class.

a) Use of a laptop

Table 8.2a shows that all the staff (who responded to the questionnaire, N=10), used the laptop for preparing learning and teaching materials in the school and for maintaining their own class records. It was considered to be most useful for these purposes.

I make professional looking worksheets and notes for use with Standard Grade, Higher Grade, Intermediate and AH (Advanced Higher), as well as test papers.

The majority (90%), used the laptop for displaying presentations in the class and for transferring work between locations in the school. When asked what were the two most important benefits of having the laptop, the teachers cited the convenience for preparing for classes at work and at home, and it generally allowing greater flexibility.

Over three quarters (80%) of the teachers who returned a questionnaire had used their laptops at home. Forty percent (N=4) had used it at home three or more times a week, 20% once or twice most weeks and a further 20% occasionally when the need arose. Activities included lesson preparation, worksheets and ‘for preparing PowerPoint presentations which I do not have time to do in school.’

Table 8.2a The Teachers’ Professional use of a Laptop
(percentage of questionnaire responses) (N=10)

	% who used the laptop	% who found the laptop useful for this purpose
Preparing learning and teaching materials in the school	100	70
Maintaining class records for my own professional purposes	100	70
Displaying presentations in the classroom	90	60
Transferring work between locations in school	90	50
Preparing learning and teaching materials at home	80	80
Maintaining whole school administration records	70	40

b) The teachers’ use of ICT

The teachers’ main uses (70-100%) of ICT for professional or school-related purposes are presented in table 8.2b.

Participating in online discussion groups, exchanging emails with parents, taking online CPD courses, creating online courses and the use of videoconferencing were much less well established, 30%, 30%, 20%, 10% and 0% respectively. These were aspects of ICT use that some teachers also indicated they were not thinking of introducing in the future, for example, using videoconferencing (30%) and creating online courses, 30%. With regard to exchanging emails with parents, 30 % indicated it was ‘beginning to happen’ and 10% that they were not thinking of doing so in the future. Thirty percent did not give a response to this question.

Table 8.2b The Main Uses of ICT by Teachers
(percentage of questionnaire responses) (N=10)

	This activity is well established
Using WWW search engine	100
Downloading material from WWW	100
Using a word processor	100
Using database or spreadsheet	100
Writing reports	100
Exchanging email with professionals in the school	100
Creating classroom resources	90
Accessing the school network	90
Exchanging email with professionals outwith the school	90
Visiting educational www sites e.g. LTS, BECTA, SCHOLAR or BBC	90
Creating or editing graphics	90
Creating class lists and records	90
Creating classroom presentations	80
Submitting returns online	70
Using subject specific packages	70

The interview data supported the questionnaire findings. The teachers had made extensive use of word processing and desktop publishing for: lesson preparation; for example, worksheets and other materials; and administration, for example, producing pupil reports. They also used the internet for research. However, one of the main perceived advantages of ICT was the use of interactive whiteboards (although not all classrooms were equipped). Some portable interactive whiteboards had been purchased which could be moved between rooms, and staff also appeared to be happy to exchange rooms to allow the equipment to be shared. The interactive whiteboards provided a range of different opportunities for teachers to present materials more clearly to the class, for example, using data projection, PowerPoint or other prepared notes, but additionally allowed for interactive input by pupils whose thoughts and ideas could easily be displayed to the class.

Whilst there was individual variety in the extent of ICT use, it did appear that most teachers incorporated ICT at least some of the time into their lessons. The use of ICT was strongly subject specific, for example, with word processing seen as important in English, digital imaging as integral to art and design. Specific software packages were used in graphic communication, simulated experiments used in science, and video images used to demonstrate dynamic processes in geography. In mathematics the teacher indicated there was less computer use by pupils due to the difficulties involved in entering symbols using a standard keyboard, *'when you're typing in formulae it's really time consuming in the computer system. So it's used as an extra resource if they wish to test themselves.'* One teacher however expressed a note of caution about his/her use of his/her laptop computer.

Having a computer has been tremendous but there is a real fear we are becoming very dependent on them and they must be maintained or replaced.

8.2.2 The impact of ICT on teaching

a) Impact on teaching and learning practices

There was evidence from the questionnaire responses that teachers perceived using ICT as having a positive impact on their teaching practices (see table 8.2c). All the staff thought that using ICT had supported positive changes in their classroom practice and contributed to their professional self-image. They all disagreed that ICT *'does not help me to add variety to my teaching repertoire'* More than half of the teachers (60%), also considered that using ICT had helped them to communicate better with parents.

Table 8.2c The Impact of ICT on Teaching and Learning Practices

(percentage of questionnaire responses) (N=10)

<i>Using ICT...</i>	Strongly Agree/Agree	Strongly Disagree/Disagree
Supports positive changes in my classroom practice	100	0
Does not help me to add variety to my teaching repertoire	0	100
Contributes positively to my professional self-image	100	0
Adds interest to my classroom presentations	90	10
Effectively, adds to the professionalism of an inexperienced teacher	80	20
Can help create better homework exercises	80	20
*Helps me to communicate better with parents	60	20

* includes nil response

When asked what were the two most important ways the use of ICT had impacted on their teaching, better presentation of teaching material was highlighted, as was the importance of ICT in administration and record keeping, and the teachers recognised its potential for

example for the use of websites, specific software packages, and more interesting resources.

All the teachers felt that the use of ICT had helped them manage teaching and learning more effectively. Examples they gave of how ICT had helped included: improved record keeping; being able to design their own programmes of work and being able to store, edit, retrieve information/ presentations easily.

I can keep a detailed work diary for my main classes and record much more assessments and keep track of progress more easily.

Time saved through the use of ICT was also highlighted allowing the teacher to be more effective.

Making course plans and general planning; evaluations; preparing work; providing feedback, etc.. This all takes a lot of time, but when in place, amendments are easy to make. I give the Higher class a detailed plan of the work covered each term or topic so that they are aware of expectations and can focus on specific tasks, and if absent can easily find out where they should be by looking in their class file on the intranet.

Use of the equipment has given me the opportunity to manage all the paperwork more effectively. Easily stored and accessible for use when needed.

The ICT resources or facilities that the teachers (N=10) found to be most useful for classroom purposes were a personal laptop computer (60%), a data projector (60%), and internet access (40%), with the laptop being used fairly regularly by 60%. Forty percent of the teachers commented on the usefulness of the laptop and data projector.

Using the projector with PowerPoint material to summarise topics; to use for revision, to problem solve, to go over tests etc.

Laptop, data projector - prepare once and reuse with minimal hassle.

Thirty percent of the teachers highlighted the usefulness of an interactive whiteboard for their teaching, but only ten percent indicated that they used it regularly. Fifty percent commented that they would like to have made greater use of one, and fifty percent, when asked what other training opportunities they would like, identified use of an interactive whiteboard. When asked what additional ICT resources that they would like to have been available, three of the teachers asked for additional whiteboards.

It is thus clear from the questionnaire and interview data that the teachers recognised the benefits of using an interactive whiteboard and a laptop computer. Namely, that they allow for re-use of resources, as well as increasing the media available for supporting teaching and learning. For example, using desktop publishing to produce materials, or prepare lesson notes in advance to be projected on the interactive whiteboard, rather than written on the blackboard during the lesson. In particular, any explanation of three dimensional or dynamic concepts was enhanced by the use of image projection. In the following quote, a teacher compares the difficulties s/he used to face using a static overhead projector to the current situation where data projection is employed for the same purpose:

I wasn't particularly good at drawing therefore it was my talking really that got everybody through, or an OHP or something. With atmospheric circulation, you know that kids find that quite difficult to imagine and therefore I can just put it up, I can have it on a loop and talk about what is happening and I think that makes life easier for them. I suppose you drew the stages beforehand and they still do that in their jotters but I think it just makes it more real if you actually see it happening.

These types of uses, whilst they do not bring about any fundamental shift in pedagogy, improve the clarity of information and present it in a way which is more appealing and engaging for the pupils. As one teacher noted

Lessons are more energetic, I can go to town a bit more, be more enthusiastic.

b) Organisation of learning and individual teaching styles

Seventy percent of the teachers indicated that greater access to, and use of ICT had changed their teaching style. The reasons they gave ranged from being able to use ICT with the whole class rather than just small groups, to it being less teacher directed. One teacher explained that the

use of an interactive whiteboard has brought more life to my teaching and gives the pupils a better understanding and access to learning than was possible before.

However another teacher noted:

I believe you have your 'own' teaching style, and resources enhance this but don't change your style.

Some felt that the use of ICT enabled the teacher to be more available during the lesson to interact with the pupils or that the use of interactive whiteboards enabled a greater level of interactivity. For example, some teachers noted that they were able to use websites in whole class activities, accessing sites such as *Google Earth* or interactive games to engage pupils of all abilities. Other teachers noted that lessons were '*less teacher directed* and had *become more interactive*.'

Other benefits to teaching of using ICT included readily being able to return to previous lessons for example in reviewing notes and presentation, or being able to store a lesson for continuation at a later stage, or printing handouts for pupils who were absent.

Classroom management was also streamlined by the convenience of some of the ICT. For example, a teacher reported the advantages of using an interactive whiteboard to watch a video compared to previous practices in the previous school. Pupils were now able to see a video more clearly while still remaining in their seats, instead of previously when '*they all had to gather round to see the video, sitting in the corner and it wasn't very good visually*'.

c) Innovative use

When asked about the most innovative uses made of ICT for learning and teaching, the teachers made reference to how lessons were presented - typically referring to using the data projector, together with activities on the interactive whiteboards, or using material available on the web with the whole class, or simply using PowerPoint presentations. One teacher noted:

I have also used PowerPoint and scanning facilities and placed Higher homework on the intranet on S5/6 class folders, so that they could look back over these outwith classroom time, if they needed to look back on them, which they could potentially view at home if they wished.

d) Impact on the curriculum

Ninety percent of the teachers (N=9) felt that using ICT had some impact on providing additional learning opportunities or extending the curriculum. For example, that using ICT provided '*more challenging resources, good extension exercises, a more interesting display of resources*' and extended access to course work. One teacher noted that ICT provided access to some ODL (online distance learning) courses. The increase in ICT resources meant that the school could now offer additional new courses.

8.2.3 *The teachers' administrative uses*

Responses to the questionnaire showed that the use of ICT for administrative purposes was well established (see table 8.2.b). All (100%) were using it to write reports and 90% for record keeping, with a further 10% indicating the latter was beginning to happen. Fifty percent shared assessment information and for a further 40% it was beginning to happen.

They were unanimous in their agreement that it made school administration more efficient, increased their own personal efficiency (both 100%) and helped them to track pupil progress (90%). This is exemplified by one teacher who states:

Use of the equipment has given me the opportunity to manage all the paperwork more effectively. Easily stored and accessible for use when needed.

The qualitative accounts supported the data with administrative uses noted including: recording pupil grades; pupil reports; attendance records and other uses. The teachers reported that they were quite comfortable with these applications, seeing them as more efficient than the traditional paper held records. However, some had experienced difficulty accessing the school server through dial-up connections from home, thereby being forced to enter data into school records whilst on the school premises. None of the staff that we spoke to had difficulty with the levels of computer competence required for these activities. For some staff the main use of ICT was associated with administration.

That is my main use, I use it all the time for recording information and writing reports and making up worksheets, I use it constantly.

The same teacher went on to identify his/her desire to further develop skills specifically for administrative purposes. The administrative use of ICT brought with it tangible benefits in terms of being able to track pupils' progress, linked to a system of 'praises and alerts' which was part of the monitoring system of attainment, and allowed for early detection of problems.

8.2.4 *Staff development*

Training opportunities taken up by the staff included: New Opportunities Fund (NOF) and Masterclass Training, PC Passport, training on specific applications software such as Microsoft FrontPage and Adobe Photoshop, and introductory sessions on Interactive Whiteboards. One teacher noted that all the training was useful as '*it has increased my knowledge and therefore my use of it.*'

The type of training available was commented on with one teacher positively stating that in-house training meant that you '*don't feel bad about asking questions*' and another requesting '*more 'user friendly' courses.*'

Of those who responded to the questionnaire, 90% indicated they used e-mail for professional exchanges with others outside of school. Fifty percent had either participated or were beginning to participate in online discussion groups. Thirty percent had taken a CPD course online or were beginning to get involved in this activity. Approximately a third (30%) expected that they would do so in the next one to two years, and only 20% were not yet thinking about this possibility. One teacher who reported s/he was using the internet for professional development said

I am doing an online course so I require to use it (the laptop) at home and at school, you get material sent to you and a book, but you also you have to study online and do tutorials online and post things up on bulletin boards.

The teachers felt that their ICT skill level improved over the duration of the project with a change from 40 % rating themselves as very competent or competent before the project, to 100% at the time the teachers responded to the questionnaire. However, whilst the staff had clearly developed in their competence and confidence in the use of technologies during the

period of the project, several of the teachers identified a shortage of training opportunities, coupled with insufficient time to capitalise on any training they had received.

So my big thing is training. It's wonderful having all of this beautiful stuff but can somebody come and show us how to make best use of it. And give us the time to use it and develop it.

Lack of training was noted as impacting on the use of ICT. As one teacher commented:

There are bound to be more ways I can use it if someone shows me how! "Did you know you could do this? There is a quicker/easier way of doing that!"

Other teachers also described the competing priorities that they as subject teachers faced in terms of their personal and professional development, depending on their other commitments. The importance of having time to consolidate what was learned was highlighted.

We have had some induction things, but I think one of the major problems personally for myself is that I am usually at a minimum timetable. I have virtually no time to try and educate myself, even if there is an Inset day. I don't have time to go back and use it, so certain things that I've thought, 'oh that looks great', I haven't utilised because of that.

Further training needs the staff identified were: using interactive whiteboards and subject specific software.

8.2.5 The barriers to teachers' use

Eighty percent of the teachers indicated that they had encountered some difficulties that inhibited their greater use of ICT generally, with the same number reporting they encountered problems/frustration when using the laptop. Three main barriers were identified: time; technical issues; and confidence in own competence. The issue of time is summarised by one teacher:

I cannot try out new ideas without preparation time ... and time is always a key issue that I never have enough of.

Another teacher highlighted 'lack of time to go on 'user friendly' ICT courses to improve my skills.'

Technical barriers to the teachers' use of ICT were identified as: difficulties of file synchronisation; access to the school network from outwith the school; the robustness of the ICT equipment; availability of relevant curricular software; and securing technical support. As indicated in section 8.2.3, the inability at times to access the school server from home counteracted its potential advantage. Some teachers highlighted barriers created by the network not functioning properly; computers crashing and difficulties in accessing the pupils' work on their accounts.

A number of teachers had experienced teething problems with the new technologies, which had proved difficult or time consuming to operate in the first instance, thereby giving the impression of detracting from rather than enhancing the educational experience. Some teachers were thus discouraged in the early stages from pursuing their use of ICT. Teachers expressed a reluctance to use technologies with classes before they felt fully in control, for fear of losing face in front of the pupils. However, one teacher described how initially, s/he had found some of the technology daunting, but with time s/he had overcome his/her reluctance to use the interactive whiteboard, and now found it invaluable:

The LCD projector, I could not live without it now, I am using the smart board and I did find that I tried it initially and then the influx of all the technology at once meant that I found the smart board was a step too far, but now I have come back to it. I have realised how useful it can be and I'm making more use of it.

Another teacher asked for subject specific training courses.

Getting to know how to use ICT effectively and can it be done better. Why can't we have subject specific inservice? "Come to this training course for (name of subject) teachers, and we will show you how you can use ICT to enhance your teaching and make it more effective."

8.3 The Impact of the Project on the Pupils

8.3.1 The pupils' use of ICT

As indicated in section 8.2.1b, the use of ICT was subject specific, and the pupils' use varied depending on the stage in school and the subjects they were studying. Table 8.3a highlights the main uses of ICT by pupils as reported by the teachers. The most frequently reported uses were: internet use, both for accessing information and downloading material; word processing; accessing the school network and use of subject specific packages. All the teachers reported that they used databases or spreadsheets for their own professional use (table 8.2b), but they do not appear to be so commonly (20%) used by pupils.

Table 8.3a The Pupils' Use of ICT - reported by the Teachers
(percentage of questionnaire responses) (N=10)

	Pupil use of ICT
Using WWW search engine	60
Visiting educational www sites e.g. LTS, BECTA, SCHOLAR or BBC	60
Downloading material from WWW	50
Using a word processor	50
Accessing the school network	50
Using subject specific packages	50
Using a video camera	30
Using stills digital camera	30
Using databases or spreadsheets	20
Creating classroom presentations	20
Creating www information pages	20

The teachers' qualitative accounts supported that the view that word processing was widely used by pupils, particularly for the presentation of essays, as was internet based research. Pupils were highly familiar with the internet as a source of information, used in conjunction with books and the library. However, the internet was seen as a convenient and often the first source of searching for information. One teacher noted that '*research on the internet often provides excellent talking points*' and allows for '*children as contributors.*' The range of pupil uses also included digital imaging in art and design, specific packages in graphic communication, and simulated experiments used in science.

8.3.2 The impact of ICT on learning

a) Positive Aspects

Teachers thought the use of ICT had a positive impact on learning and the learners. For example, all respondents to the questionnaire disagreed with the statement *Using ICT does not contribute positively to the learning of my pupils*, suggesting they think using ICT does make a positive contribution to pupils' learning. They were fairly evenly divided as to whether ICT should be used for part of most lessons, with 50% agreeing and 40% disagreeing. Ten percent did not respond to the question. One teacher noted that '*it has helped me, and my pupils studying the subject.*'

All those responding agreed that using ICT can provide access to revision materials for pupils, the majority (80%) agreed it helped to create better homework exercises and helped parents to support homework (90%).

When asked what were the two most important benefits the pupils had gained as learners through the use of ICT, responses included the pupils' improved ICT skills, access to information and a greater variety of resources, and immediate feedback on performance skills. ICT also assisted problem solving skills, visual learners and revision. Ninety percent of the teachers also indicated ICT had enabled them to provide additional learning opportunities or an extended curriculum.

More challenging resources from 'live sites' have been frequently used as class activities and extension activities.

Similarly to the impact of ICT on teaching, in considering the impact of ICT on learning, we can distinguish between those uses of ICT that enhance the presentation of pupils' work, or enable a different style of output, such as word processing or PowerPoint presentations, as against activities which fundamentally alter the ways in which pupils learn.

Certainly, the pupils made good use of word processing for presentation of English essays and assignments in other subjects, although they tended not to use computers when planning and drafting essays, this was still done largely by hand. This, at least in part could be attributed to the distribution of laptops in the school – to use word processing throughout the construction of essays would involve moving the whole class to the computing suites for a large proportion of their teaching time, as the classroom facilities would not meet this need. The problem was also compounded by the lack of technological communication between home and school. Work started in school on a computer, could not readily be transported home to be worked on as homework. Consequently because the shift from hand written essays to word-processed documents was only partial, pupils rarely used ICT for the whole process.

However, there were some examples of significant enhancement of teaching and learning styles, for example by using the virtual to experience the practical. In science, we encountered great enthusiasm for software packages that allowed simulated experiments to take place. These were not seen as a substitute for practical laboratory experience, but were seen as a significant extension of those activities, by demonstrating experiments which would be dangerous in a school setting, or by being able to simulate repetitive procedures in order to gather meaningful data.

Well, we have bought two expensive pieces of software one for chemistry and one for physics, where you can bring on different solutions. With the fact that we are all connected up here in this class, the 20 kids can all be doing their own thing with the one programme. That's fantastic, instead of getting the chemicals out every single day, its no problem.....Get the projector in and the board and I can do the demonstrations by the click of a switch. It's good. With a subject like chemistry and science where there is a lot of practical work involved they have got to get the hands on experience. For me it's where perhaps experiments may be repetitive, or there may be practical problems with hazards that I see the use of ICT as useful.

Other fundamental changes in learning could also be seen in science where practical investigation was enhanced by the use of data loggers that could record data in ways that were impossible for pupils, either monitoring very rapid change, or allowing experiments to run over hours or days, much beyond the scope of the lesson. Data could also be tabulated or displayed by computers allowing pupils to concentrate on the evaluation of the findings.

The use of video recording in PE had made a significant difference to the ways in which pupils were able to evaluate their physical performance. These were personalised, private, and much more sensitive than the methods used in the past as described here:

You have got to watch a performance and then be able to make comments on the performance. To help them to do that, they don't like "right everybody sit, we're going to watch Jimmy doing this", and everybody sits and watched Jimmy. "Right what could Jimmy have done better?" It's very embarrassing for some of the children so it's much easier if we use the video camera so its self-evaluation then.

b) Negative Aspects

With regard to the negative aspects of ICT use, half (N=5) thought that using ICT detracted from pupils' learning. Reasons given were that pupils became overly reliant, simply cutting and pasting information, were more concerned with the appearance rather than content of their work, and the distractions of the internet.

8.3.3 Impact on attainment, achievement and motivation

The questionnaire responses (Table 8.3b) indicated that either all, or the majority, of teachers thought the use of ICT had a positive impact on pupils' motivation, self-esteem, enthusiasm and engagement with learning and attainment.

Table 8.3b The Impact of ICT on Pupils' Attainment, Motivation and Self-esteem
(percentage of questionnaire responses) (N=10)

Using ICT	Strongly Agree/Agree	Strongly Disagree/Disagree
Motivates most pupils	100	0
Leads to raised attainment for many pupils	100	0
Extensively reduces pupils enthusiasm for learning	10	90
Allows pupils to develop greater independence	80	20
*Does not increase pupils' self-esteem	10	80
*Improves boys' engagement with learning	70	20
*Improves girls' engagement with learning	60	30

* includes nil response

However, whilst one of the project aims includes an aspiration that the use of ICT would raise attainment and achievement, the teachers who were interviewed felt unable to provide any hard indicators demonstrating the effect of ICT on attainment. They indicated that any changes in such statistical data could not necessarily be causally linked to the use of ICT. The types of data which schools record for statistical purposes do not capture the broader and more complex issues of motivation, or achievement in the wider sense. The qualitative accounts of the teaching staff did however provide evidence that ICT had impacted upon pupils' engagement with, and involvement in learning.

a) Engagement with learning

The use of novel and interactive approaches was widely seen to be motivating for pupils.

You have got to make science exciting. I want kids to be looking forward to coming to science. For me the use of ICT in the department, it helps us immensely. The variety of different uses, be it the presentation, the swiftness in which you can get something up that looks professional rather than some sketched diagram on the board. I feel sometimes I'm going over the top but when we have been using the suite over there, or when we have got data logging experiments on the go, or chemistry songs on, or periodical tables jumping around the kids are enthusiastic and they love it.

Although lessons of the type described above were considered to be exciting for the pupils, they were seen to require additional preparation for the teacher, were more difficult and time consuming than more traditional approaches, and as such unsustainable in the longer term.

I have put on a few classes where I have really gone to town using ICT and I sometimes wonder if I could keep it up all day long, class after class.

b) Self esteem

Pupil interaction with ICT learning packages was identified as a means of learning which, in some circumstances was seen to be potentially less damaging to pupil self esteem than interaction with the teacher. Whilst some pupils could feel very sensitive about being corrected by teachers, self-correction exercises allowed pupils to correct their mistakes privately, without the risk of, what might be construed as humiliation.

If they get it wrong, it's not me saying "For goodness sake look what you've done", it's just the computer saying have another try. Doing it with headphones means it's quite private to them.

c) Presentation of work

Teachers reported that word processing by pupils was particularly motivating for those pupils whose handwritten work was handicapped by poor spelling, untidy handwriting or other aspects of presentation. In these cases the use of word processing packages could eliminate a major barrier to progress, as they could concentrate on the subject material rather than struggling with their presentation. Links were identified in these cases between the use of ICT and the pupil's achievements, confidence in their work and their general self esteem, particularly for the less able pupils.

From a point of view of a less able child perhaps, it helps them to feel that they can keep up with their peers. They can go on the computer and produce a nicely presented document as well, where as if they were doing it by hand, there is an obvious difference in the level of stuff that they put out.

Related to this was the longer term benefit of building up a body of neat and legible work, which provided a sounder basis for future revision, and enabled pupils to take greater ownership of their work.

8.3.4 Gender differences

The teachers interviewed reported parity between the sexes in terms of the motivational aspects of using ICT. Whilst boys, it was felt, were more used to using computers for leisure purposes, particularly playing games, this did not translate into a significant difference in their engagement in learning activities. This is supported by the questionnaire responses shown in table 8.3b where there is only a 10% difference in response between agreement about the engagement with learning of boys (70%), compared to the engagement of girls (60%).

8.3.5 Age and stage differences

With respect to differences in the pupils' use of ICT and their attitudes towards it, teachers reported that older pupils were more discerning in their attitudes to ICT. Although the younger pupils could be more easily excited and motivated by any introduction of ICT into the classroom, the older pupils were more able to weigh up the educational benefits of particular applications, and the motivational aspects of ICT were more measured.

I think that as the kids mature and head toward the exams, in 5th year and 6th year they become much more aware of what they are doing, is it helping them, is it not..... the older ones want work that is going to give them results at the end of the day, and if you just give them a wee exercise on a computer just for the sake of giving them that, they recognise it and they're not interested.

8.3.6 *The barriers to pupils' use of ICT*

The home-school networking links initially planned were not possible due to the managed service provider not allowing pupils' access to school's intranet at home. If the school network was not functioning properly, pupils were unable to access websites in school.

Because of the way the computers (including laptops) were deployed within the school the use of computers by pupils was largely controlled by teachers. Hence there was little scope for pupils to choose when they felt it was appropriate to use the computers, nor was it feasible for teachers to design courses where pupils moved on and off computers for different pieces of work, as they progressed at their own pace. Consequently the laptops which were situated in classrooms tended to be used as "add-ons" offering extension work, or rewards to those who finished their other task first. Although better equipped than most schools, Glen Urquhart High School had not been able to address the issue of allowing flexible and spontaneous use of computers as the need arose.

8.4 Summary

- Each teacher had been issued with a laptop for personal and professional use, all used it for preparing learning and teaching materials in school and for maintaining their own class records. The majority (90%) used it for displaying presentations in class and for transferring work between school locations, and eighty percent used it at home. (8.2.1)
- Teachers felt using ICT had a positive impact on their teaching practices. Using ICT had: supported positive changes in classroom practice; contributed to professional self-image; helped manage teaching and learning more effectively; and had helped them to communicate better with parents (60%). (8.2.2)
- Teachers had exchanged emails with professionals in school (100%) and outwith school (90%); 50% had either participated or were beginning to participate in online discussion groups; and 30% had taken a CPD course online. (8.2.1/4)
- The ICT resources/facilities teachers found most useful for classroom purposes were: personal laptop computer (60%); data projector (60%); internet access (40%); interactive whiteboard (30%); with the laptop being used fairly regularly by 60% of teachers. (8.2.2)
- 70% of the teachers indicated that greater access to, and use of ICT had changed their teaching style. Benefits included: the ability to use ICT with the whole class rather than just small groups; the interactive whiteboard enabled a greater level of interactivity; classes less teacher directed; and storing lessons for future use. (8.2.2b)
- Teachers felt that their ICT skill level improved over the duration of the project with a change from 40 % rating themselves as very competent/competent before the project, to 100% when the teachers completed the questionnaire. Further training needs the staff identified were using interactive whiteboards and subject specific software. (8.2.4)
- Barriers to teacher use of ICT included: file synchronisation; access to the school network from outwith the school; robustness of the ICT equipment; availability of relevant curricular software; and securing technical support; needing time to try out new ideas, and teachers having confidence in their own competence. (8.2.5)
- Teachers considered that the use of ICT had a positive impact on learning and the learners. The most important benefits the pupils had gained as learners through the use of ICT included: the pupils' improved ICT skills; access to information and a greater variety of resources; immediate feedback on performance skills; assisting problem solving skills; enabling provision of additional learning opportunities or an extended curriculum. (8.3.2)
- All, or the majority, of teachers thought the use of ICT had a positive impact on pupils' motivation, self-esteem, enthusiasm and engagement with learning, and attainment. However the seven teachers who were interviewed felt unable to provide any hard indicators demonstrating the effect of ICT on attainment. (8.3.3)
- A barrier to the pupil use of ICT was that the home-school networking links initially planned were not possible, due to the managed service provider not allowing pupils' access to school's intranet at home. In addition if the school network was not functioning properly, pupils were unable to access websites in school. (8.3.6)

SECTION 9

THE IMPACT OF THE PROJECT – THE GLEN URQUHART HIGH SCHOOL PUPILS' PERSPECTIVES

9.1 Introduction

The aim of project as far as the school was concerned was *To raise achievement amongst pupils through their involvement with the project*. As already indicated in section 7.3.1, ICT equipment provided through the FLaT project included laptops. However, there was no intention to give pupils a laptop for personal use and the laptops were integrated into computer suites, predominantly ICT and technology, together with existing desktop computers, and in limited numbers (two or three), in classrooms. Pupils' use of ICT is therefore either in a number of designated computer suites as a whole class, or more limited use within one class.

Here we present data from the pupil questionnaire that focused on pupils' use of ICT, both in school and at home, together with data from interviews conducted with a sample of S4, S5 and S6 pupils in October 2005. The pupils, including S5 and S6 school leavers, completed the questionnaire in June 2005. The current S5 year group (2006-07) is the cohort who joined the newly opened school as S1 pupils in 2002. Although the majority of questions on pupils' use of ICT in school asked the pupils about their use of both desktop and/or laptop computers, we are aware that most pupils' use of ICT would be predominantly using desktop PCs.

We present here the data from the pupils (N=160), a 71% return rate, of whom 59% are male pupils. For a more detailed breakdown of the data for years S1/S2, S3/S4 and S5/S6, see Appendices 5-8.

9.2 The Impact of the Project on the Pupils

There was evidence of a wide range of skills at all stages, but at the time of completing the questionnaire inevitably younger pupils had less experience of using ICT compared to the more senior pupils. We were interested to know their perceived level of competence of ICT after using desktop or laptop PCs during the project. Approximately one third (36%) of all the pupils in the school thought that they knew 'a lot/I'm a real expert', with 59% indicating they knew 'enough to get by' about computers.

9.2.1 *The frequency of ICT use*

In the questionnaire we asked the pupils to estimate how often they used a desktop or laptop PC in school each week. The levels of use of both machines were almost identical. The most common pattern of use was once or twice per week by just over one third of the pupils (39%), with 28% using ICT three or four times per week, and 15% using it every day. The figures for the whole school conceal a pattern of ICT use that show approximately one third of S5/S6 pupils use it daily; approximately one third of S3/S4 pupils use it three or four times a week; and approximately a half of S1/S2 pupils use it once or twice per week. These figures are perhaps not surprising given the greater number of periods for fewer subjects higher up the school, compared to S1/S2.

9.2.2 *Specific uses of ICT*

The data in table 9.2.2, (Appendix 5) indicate a high level of pupil use of ICT. Over 80% of the pupils used ICT to word process, search for information on the internet, and play music and simulation games. Other frequently used applications by over half of the pupils (51%-78%) indicates a wide variety of use: drawing/designing, making PowerPoint slides, emailing friends, spreadsheets, databases, scanning pictures or text etc.

9.2.3 Differences across curricular areas

There were discernable differences in patterns of pupil use in different curricular areas. The pupils were due to complete the questionnaires in the week following the introduction of the new timetable. Therefore asking the pupils about the use of ICT in the previous week (as we had asked Ardnamurchan) did not seem to give fair or realistic picture of its use. Hence we asked pupils to indicate if they had usually used either a desktop PC or laptop in each of the subjects during the previous year. This is perhaps a more accurate assessment of pupils' use of ICT than that used for Ardnamurchan High School where we asked about ICT use in the previous week (see section 4.2.3).

Table 9.2.3a The level of computer use by the S1-S6 pupils

(*These figures show the % of that sub sample of pupils who actually took the subject the previous year).

Think about the subjects you studied before the timetable changed			
	N = 160	N = 160	N = 160
	% who had this subject before the timetable changed	* % who used a laptop in this subject before the timetable changed	* % who used a desktop in this subject before the timetable changed
English	96	28	59
Mathematics	94	3	19
French	59	5	34
German	64	11	38
Art and Design	63	11	43
Basic ICT/ Computing/ Information Systems	66	64	21
History	74	15	33
Geography	66	18	32
Music	61	4	10
RE/RME	86	20	38

Regular use of ICT (desktop or tablet/laptop) tends to be in subjects which particularly lend themselves to project type work in which pupils can be required to seek out and use information from electronic sources e.g. English, religious education, social subjects; or to use programmes particularly designed for that subject, for example, technology, art and design, science. The most frequent uses indicated to us are shown in the above table 9.2.3a: English and ICT, followed by art and design and RME. As laptops were deployed for whole class use in ICT, it is not surprising that this was the subject in which they were used the most (64%).

It is less straightforward to present the data for years S1-S6 in one table as above, for those subjects which are taught together in S1/S2 and then as discrete subjects in later school years. For example: science (biology, chemistry and physics at S4-S6); technology and home economics (craft and design, graphical communication and home economics at S4-S6). This is due to being unable to simply total the data for each year group. However, table 9.2.3b (Appendix 6) shows the frequency of use of ICT (both desktop, or laptop) by pupils in these curricular areas in the different year groups.

9.3 Advantages of the Pupils' Involvement in the Project

9.3.1 The impact on learning

The data from the pupil questionnaire (table 7.3.1, Appendix 7) indicate that there were a number of benefits gained by pupils through using ICT. It provided access to resources, for example the internet (84%), finding information that the pupils claimed to be not available in books (91%); improved ICT skills (86%) and flexibility of use. Approximately two thirds of

the pupils (63%) indicated they could use ICT to continue their school work at home and show their parents their work (56%), thus meeting one of the key aims of the project. Equally, pupils could access machines to continue working outwith lesson times in school, for example lunchtime (78%).

Table 9.3.1 The Positive Aspects of ICT Use
(percentage of questionnaire responses)

What I like about using ICT in school	Agree a lot/ Agree			
	S1/S2 N=77	S3/S4 N=58	S5/S6 N=25	Total N=160
I can find information that I cannot find in books.	95	85	92	91
I can save my work in a safe place.	94	90	80	90
I am learning a lot about how to use a computer.	90	86	72	86
I get to use the Internet during lessons.	79	86	96	84
I can continue my work at lunchtimes.	81	74	80	78
I get to use my own ideas.	81	72	56	74
It has helped me to learn or understand more in some subjects.	73	72	72	73
It helps me to do better at school work.	81	64	60	71
I can easily continue my school work at home.	66	64	52	63
I can show my work at home.	64	50	44	56

In assessing the impact of ICT on the pupils' skills and understanding, over three quarters of the pupils (see table 9.3.1) said it had helped them to learn and understand better in some curricular subjects (73%) and to do better at their school work (71%). This view was reiterated by the pupils in the interviews. Pupils mentioned the helpfulness of teachers using a data projector in whole-class teaching, for example, map work in geography:

If s/he is talking about something then we don't really know where to look on a map, but if s/he projects it onto the screen, s/he can use a pointer and a mouse to show us what s/he is talking about on the map and we can look at ours.

S5 Pupil

The use of the internet has also allowed pupils to take more responsibility for their learning.

Well when you are told to do some research you have to find the websites, they don't give you links, you have to stand on your own two feet and find out where to get the information.

S4 Pupil

Additionally, some teachers made use of the school intranet to distribute answers to the class and homework exercises which the pupils found helpful.

Well the Maths teacher has put like, if you're doing homework, then after she's marked it she will put the answers up on the Intranet so you can go and see what you have done wrong.

The worked out answer. So if you didn't do the working out and you got it wrong, you can look at that.

S4 Pupils

9.3.2 *Impact on attainment, achievement and motivation*

a) *Engagement with learning*

With respect to motivation, the majority of the pupils (88%) thought that school-work was more interesting and fun as a consequence of using ICT (Appendix 7). One pupil said they found revision much more fun if done via the interactive exercises on the school intranet.

On the Intranet when you are doing revision and things on some computers it can be interactive, which I think is a better way of learning, rather than looking through plain books of text, when you can interact and have fun and learn at the same time.

S4 Pupil

The use of an interactive white board by teachers was thought to enhance teaching and learning through pupil participation:

We can all see what is on the teacher's computer screen up on the wall and we do it as a class, and we can all get up and write something, so that is quite good.

In addition to school work, approximately one quarter of the pupils considered that a major advantage of ICT was being able to use it for social/entertainment purposes, for example, playing games, listening to music, watching DVDs, as well as the internet for leisure purposes.

b) *Presentation of work*

The questionnaire data (Appendix 7) indicate that the majority of the pupils, over 90%, claimed that ICT was a useful tool for aiding presentation of work by making it look neater and easier to edit. These findings were supported in the responses to the open question 'What for you were the two best things about being involved in the laptop project?' which indicated that pupils valued ICT for presentation and neatness of their work, doing work faster, and using the internet for research/information.

9.4 **Disadvantages of the Pupils' Involvement in the Project**

The major problems identified most frequently by the pupils from the questionnaire data (table 9.4, Appendix 8), were: the inability to link school computers to their home computer (53%); less up-to-date programs on school computers compared to the home computer (41%); and insufficient opportunities to use computers in school (41%). The unreliability of computers was only seen to be a problem by approximately one third of pupils, with 34% indicating technical problems encountered from their use. A very small minority (9%), indicated they had no one to go to for help if they had a problem with a computer.

These findings were supported in the responses to the open question 'What for you were the two worst things about using the laptop or desktop PCs in school?', and the pupil interviews.

Yeah, only half of it saved and you had spent two hours on a drawing and it wouldn't save. I'd rather just work in a jotter with a pen and know where it is.

S5 Pupil

Additionally they also mentioned problems, for example, being unable to access the internet and restricted internet access; slow running school computers; being unable to download files and losing files, insufficient memory space to save work and being slow at typing.

Forty one percent of pupils indicated they were not getting to use computers as frequently as they would like, but table 9.4 shows this view was most prevalent in S1/S2 and S3/S4, (47%),

the S4 pupils being the cohort who have had the longest use of machines. A much smaller number of S5/S6 pupils, (8%), held this view.

Table 9.4 The Negative Aspects of ICT use.

(percentage of questionnaire responses)

What I don't like about using ICT in school	Agree a lot/ Agree			
	S1/S2 N=77	S3/S4 N=58	S5/S6 N=25	S1-S6 N=160
The laptop or desktop PC does not link up easily with the computer I use at home.	44	59	68	53
I don't get to use the laptop or desktop PC in school often enough.	47	47	8	41
The programs on the laptop or desktop PC are not as good as the ones on the computer at home.	42	47	24	41
There are too many technical problems.	33	31	44	34
The teacher doesn't let us try things out for ourselves.	42	28	12	32
I worry that I might break something so expensive.	36	28	20	31
The work I have to do on the Laptop or desktop PC is boring.	31	31	28	31
The laptop or desktop PC breaks down too easily.	25	29	36	28
The laptop or desktop PC does not work reliably with the school network.	18	24	20	21

9.5 The Pupils' Use of ICT Outside of School

With regard to access to computers outside of school, the majority of the pupils (96%), indicated they had a computer at home, and 89% of them were able to access the internet at home. We asked the pupils to estimate how often outside of school they used a computer for school-work each week. There was a wide spectrum of frequency of use, with 26% of the pupils using it a 'few days a month' and the same number (26%), using it 'three or four times per week'. Nineteen percent used it one or two days per week'.

In addition to using a computer to complete homework, pupils also used it for social or entertainment purposes. The most frequently reported activities were playing music CDs, playing DVDs and sending/reading email.

9.6 Summary

- The pupils used desktop computers, laptops in computer suites for whole class use, or the small number of classroom based computers. The questionnaire data presented are from 160 pupils, a 71% return rate, of which 59% were boys. (9.1)
- 36% of pupils indicated they felt they knew 'a lot/I'm a real expert', as against 59% who felt they knew 'enough to get by'. (9.2)
- 39% of pupils reported using desktop or laptop PCs once or twice per week, 28% reported three or four uses per week, and 15% reported using ICT every day. The frequency of use increased higher up the school. (9.2.1)
- Over 80% of pupils used ICT for the following functions: word processing, internet searches, playing music and simulation games. Over 51% used PowerPoint, drawing/designing packages/email, spreadsheets and databases. (9.2.2)
- Pupils were asked in which subjects they had usually used computers in the past year. The highest use was reported in subjects which used the internet as a resource e.g. English, social subjects and RE and those subjects which made use of specifically designed software e.g. science subjects, craft and design, graphic communication and home economics. (9.2.3)
- 63% indicated they could continue to do their work at home and show their parents (56%). Three quarters (73%) claimed ICT helped them to learn and understand better in some subjects. (9.3.1)
- 88% of pupils claimed using computers made school work more interesting, and over 90% of pupils reported that ICT was a useful tool for aiding presentation and editing of work. (9.3.2)
- Pupils' negative responses focused on the failure of the school computer system to link up properly with home systems (53%) and the less up to date programs in school compared to home computers (41%). 41% felt they had insufficient opportunity to use computers in school; a view which was much more prevalent in S1/2 and S3/4 than in S5/6. (9.4)
- 96% of pupils had access to a computer at home and 89% had internet access. 26% used a computer at home for school work 'a few days a month' and an equal proportion (26%) claimed to use it 3-4 times per week. Additionally home computers were used for social and entertainment purposes such as music and DVDs and email. (9.5)

SECTION 10

THE IMPACT OF THE PROJECT – THE GLEN URQUHART HIGH SCHOOL PARENTS' PERSPECTIVES

10.1 Introduction

This section addresses two main themes: parental views of the benefits of the project to pupil motivation, achievement, teaching and learning in the school (Aim 2), and the impact of the project on improving home–school links (Aim 3). Some parents were also community users of the facilities in the school, and although data about community use was gathered during parental interviews this is reported separately in section 11 which focuses on community use including ICT facilities.

Data from parents were collected by means of six semi-structured telephone interviews which were followed by a questionnaire survey. The interviewees were drawn from a self-selected sample who indicated their willingness to participate in response to a letter sent to them. The development of a short (two page) tightly structured questionnaire was informed by these interviews and was issued to all parents in March 2006. Thirty nine parents responded (28% return). Almost all of the responses were from parents of pupils in S4, S5, and S6, (approximately one third from each year group). All the thirty nine parents, (100%) had a computer or laptop at home. Of these, 77% (N=30) used it on a daily basis with the remaining quarter using it several days or once/twice per week. Eighty percent of parents described themselves as fairly/very experienced computer users.

10.2 Benefits of the Project on the Pupils

The questionnaire data (table 10.2) show that there was unanimous agreement (100%) amongst parents of the importance of learning to use computers at school. The parental responses in relation to the pupils' opportunities to use ICT show that they were positively disposed towards the project. Sixty two percent of questionnaire respondents strongly agreed/agreed that the project 'overall has been of benefit to my child' and 69% thought that the school ICT facilities 'helped my child learn about computers'. The benefits were perceived in terms of computer competence and confidence, access to information and the use of state of the art technology.

More confident using computers and software.

Increased awareness of the internet as a resource for studies.

Enhanced learning opportunities via electronic whiteboards etc.

Interview data (N=6) indicated that the main benefit perceived by parents was preparation for the workplace. The following comment from the open questions in the questionnaire was typical of many responses:

They (computers) are a major part of our adult lives now and children must have access to them at school so they learn to use them.

However, two interviewees commented that their home environment had stimulated their children's interest, to the extent that parents could not distinguish the contribution of the home from that of the school as witnessed in this comment:

It's chicken and egg really, (my son) is interested in computers and always has been – we've had a computer in the house for 12/13 years and he has grown up with a computer.

Additionally three of the parents interviewed remarked on the particular importance of technology in rural areas, for running small businesses, communicating, shopping and generally keeping abreast.

Questionnaire responses revealed that over half of respondents thought there had been intrinsic benefits from the computers for pupils. Sixty seven respondents strongly agreed/agreed that additional computers ‘has helped my child learn in other ways’. However, there was less awareness amongst those parents interviewed of the potential for the computer to be used to enhance and improve educational processes and outcomes, generally their interest lay with their children developing the skills to use the computer competently.

Table 10.2 The Parents’ Views on Teaching and Learning

(percentage of questionnaire responses) (N=39)

How much do you agree with the following statements? NB the term ‘computers’ includes laptops and/or tablet PCs.	Strongly agree/ Agree	No view either way	Strongly disagree/ Disagree
I think it is important that my child learns to use computers at school.	100	0	0
Having the additional ICT resources in school provided by the HFS project has helped my child learn about computers .	69	26	5
Having the additional computers in school has helped my child learn in other ways .	67	33	0
*Overall I think the HFS project has been of benefit to my child.	62	28	8
Using computers has motivated my child to learn.	52	33	15
I think my child should use computers more often in school.	46	39	15
Using computers in school has improved my child’s performance at school.	46	39	15
Using computers has not made my child more interested in their school work.	44	0	57

* includes nil response

Approximately one half of the parents, 46%, felt that they would like their child to have used computers more often at school. Whilst parents were clearly keen that the children become adept at computer use, and felt this had been achieved, they were less certain about the impact of ICT on their children’s education more generally.

Parents were divided as to whether the use of computers had an impact on improved pupil performance, and motivation in school work, with a small majority reporting favourable improvements in these areas, but equally a significant proportion holding no views. With regard to engagement with learning, approximately one half of the parents (52%) thought that using computers had helped to motivate their child to learn, and 46% agreed that its use had improved their child’s performance at school (39% had no view and 15% disagreed). However, whilst 44% agreed with the statement that ‘using computers has *not* made my child more interested in school-work’, over half (57%), disagreed and clearly thought that computers had made a positive impact on their child’s level of interest.

He has taken a great interest in engineering through graphics and auto cad.

More enthusiastic to do assignments - instead of writing, he now types.

Amongst interviewees, there were two cases where the use of computers was felt to have impacted significantly on the child's education owing to the particular needs of the children, and clearly the school had been able to harness the interest in these two cases by offering particular support that would not have been possible without the technology.

10.3 Disadvantages of the Project

Although the parental responses were largely positive, with only 5% of questionnaire responses indicating that there had been disadvantages for their child using computers, there was a note of caution evident about their potential over-use in the interview responses as well as some of the questionnaire comments. Health issues were raised regarding lack of exercise, posture, eyesight and reduction in social interaction if the computers were in continual use. Parents seemed to be happy with the extent of computer use at the moment, but perhaps not keen for it to be extended much further:

I can't see pupils sitting in front of computers all the time in all their subjects, in fact I don't think it would be a good thing, perhaps already there is quite a nice balance.

Additionally, some parents were concerned about the loss of basic skills such as spelling, handwriting and mathematical skills due to over-reliance on technology, and in these cases there were some parents who felt that these detrimental effects were already in evidence:

My son is a case in point, his spelling could definitely be a bit better (although he probably wouldn't like me saying so), but when they can go on the computer and have it all underlined for them where there's a mistake, it does mean they don't have to try so hard.

As against this, some parents felt that these very facilities had supported their children with specific learning difficulties relating to literacy and numeracy, so clearly there is case to be made for judicious use of ICT to support those for whom presentation and spelling may be a barrier, but encouraging rigorous approaches where appropriate. The parent who made the above comment also indicated that the current generation of young people possess a wide range of skills that their parents did not have.

Some parents were also aware of the potential for computers in school to be used in ways that might distract rather than enhance learning (for example surreptitious playing of games), and there was a level of concern that these activities should be well monitored by the teaching staff. However, when asked what future developments they would like to see, three parents expressed the hope that pupils would be given more frequent opportunities to use laptop PCs. Individual comments included an aspiration for up to date technological facilities to be extended to all classrooms to expand learning opportunities, with for example, interactive whiteboards to increase pupil interactivity; and to take Highers in subjects such as sociology and media studies.

10.4 Home-School Links

In terms of strengthening parent involvement in homework, we found that just over one third (41%) of parents strongly agreed/agreed with the statement 'I can see my child's school work through his/her use of the computer at home' (see table 10.4). As already indicated in section 7.3.1, it proved impossible for the school to fulfil its original aims of improving home-school links, by enabling pupils to access work from the school intranet at home and for parents to see their work.

One parent expressed the hope that pupils would be able to access the school network.

The ability to access school work from home if bad weather stops them getting to school.

Table 10.4 The Parents' Views on Communication and Information Exchange between School and Home

(% of questionnaire responses) (N=39)

How much do you agree with the following statements? NB the term 'computers' includes laptops and/or tablet PCs.	Strongly agree/ Agree	No view either way	Strongly disagree/ Disagree
I can access information about the school, e.g. the curriculum, events, via the school website .	59	15	26
*I can see my child's school work through his/her use of the computer at home .	41	0	54
I sometimes communicate with the school and/or teachers via email .	41	5	54
*The school sometimes communicates with me via email .	39	3	57

* includes nil response

In terms of information transfer between school and the parents, the school website was the most frequently used ICT source of information about the school, with 59% of parents agreeing that they 'can access information about the school ... via the school website'. As a means of direct communication with parents, the new technology was less well established as email was not widely used as a means of communication between parents and the school. Although around 40% reported communication via email, the interview data would suggest that these were occasional messages rather than the normal form of passing information, and one parent expressed frustration at the unresponsiveness of the school to emails. However, interview data also identified a particular case of a child whose support needs required frequent missives from the school to the parents as incidents arose on the school premises. In this case the Guidance teacher always contacted the mother by email, who was in a position to respond at short notice.

This suggests that whilst email as the main channel of communication between the school and parents was not the norm, that the school could, and would use it flexibly and creatively, in situations where it met the needs of a particular family.

10.5 Summary

- All questionnaire respondents (N=39, 28 % return rate) had a computer or laptop at home, 77% used it on a daily basis with the remaining quarter using it several days or once/twice per week. Eighty percent of parents described themselves as fairly/very experienced computer users. (10.1)
- All questionnaire respondents strongly agreed/agreed about the importance of pupils learning to use computers at school, 62% cent strongly agreed/agreed that overall the project had been of benefit to their child, and 69% that the school ICT facilities helped their child learn about computers. (10.2)
- The parents interviewed showed less awareness of the potential for the computer to be used to enhance and improve educational processes and outcomes. (10.2)
- Interview data indicated that the main benefit of the project perceived by parents was preparation for the workplace. (10.2)
- Parents were divided as to whether the use of computers had an impact on improved pupil performance and motivation in school work. With regard to engagement with learning, approximately one half of the parents (52%) thought that using computers had helped to motivate their child to learn, and 46% agreed that its use had improved their child's performance at school (39% had no view and 15% disagreed). However, whilst 44% agreed with the statement that 'using computers has *not* made my child more interested in school-work', over half (57%), disagreed and clearly thought they had made a positive impact on their child's level of interest. (10.2)
- In two cases parents felt the use of computers had impacted significantly on the child's education owing to the particular needs of the children. (10.2)
- Only 5% of questionnaire responses indicated any disadvantages for their child using computers, but there were some notes of caution evident about the potential over-use. These included health issues, for example lack of exercise, posture, eyesight, reduction in social interaction, and a concern about the loss of basic skills such as spelling, handwriting and mathematical skills due to over-reliance on technology. (10.3)
- Forty one percent of parents had seen their child's school work through his/her use of a computer at home; 59% had used the school website as a source of information about the school; and 39% had communication with the school via email. Interview data suggests that these were occasional messages rather than the normal form of passing information. (10.4)

SECTION 11

THE IMPACT OF THE PROJECT ON ADULT LEARNING PROVISION – THE PERSPECTIVES OF THE GLEN URQUHART COMMUNITY CENTRE STAFF AND USERS

11.1 Introduction

This section of the report addresses elements of:

- Aim 3 - The assessment of the project's impact in improving community links and building partnerships with other educational/training providers.
- and
- Aim 4 - the identification of what, if any, improvements the use of ICT has made in terms of developing and delivering greater learning opportunities for teachers, pupils and adult learners.

The data are derived from individual interviews conducted via telephone with the Community Centre Coordinator, the Community Learning Officer and two centre users in May 2006. The data also include the responses from parents of school pupils in the parent questionnaire in March 2006.

Firstly, the roles of the centre staff and the adult learning activities provided are detailed. The impact of these activities are discussed from the centre staff and users' perspectives. The section then discusses the barriers to the project and factors which facilitated the success of the project. It concludes with suggestions for potential areas of expansion of adult learning provision, and advice to other local authorities considering setting up a similar initiative.

11.2 The Community Centre Provision and Staff

The provision of adult courses at the community centre has focused on leisure and learning opportunities for adults living in the wide geographical area served by the centre. These include an active arts/music programme, for example concerts, theatre, film club etc. in addition to a variety of community learning and leisure courses, pre-school, and out of school care. The community centre coordinator has been in post since the building opened in 2002, manages the venue and promotes an active arts programme. The community learning officer has been in post since 2004 with a budget and a remit that includes responsibility for adult education, community development, and youth work. The local FE college initially provided courses via an outreach tutor, although this no longer happens.

Both staff members thought that although it was nearly four years since the school opened, the community centre provision was still going through a 'bedding in' process. With the establishment of a completely new community provision in the local community there were initially tensions with both the existing community provision and the school. For example, the local village hall had hosted arts/social events and perceived the new provision as a threat. However, both providers had worked together and now each offered different arts events suited to different audiences.

With regard to working relationships with the school, it appears that the school's needs had often taken precedence over that of the community's needs. This was sometimes to the detriment of the community, for example, the school having priority of the use of rooms and ICT equipment. However, with time and changing senior management personnel, closer collaboration and co-operation is being established between the community centre staff and the school. The community centre has a steering committee on which the Headteacher sits, and there are now regular weekly meetings between the Headteacher and community learning officer.

11.3 The Impact on Learners

11.3.1 The community centre coordinator and learning officers' perspectives

One of the main benefits of the project is that it has provided additional learning opportunities for the community. The building also acts as a central venue for the region so that events, for example, theatre productions can take place.

a) ICT and other community learning provision

An important aim of the project was to allow the community more access to, and improving their knowledge, of ICT. When interviewed, the Community Learning Officer indicated s/he was unaware of the project's existence. However, s/he thought that s/he had been successful in facilitating the provision of formal tutored courses for adults to learn how to use computers. This was in response to demands from users, particularly older adults. Courses provided included 'Computers for the Terrified' and 'Computers for Beginners'

We usually get 6–8 people on each course and there are only 8 computers in the ODL room.

Access to ICT courses, which were previously unavailable locally, has also enabled members of the local community to gain ICT skills to support their businesses by taking ICT courses such as European Computer Driving Licence (ECDL) and specialised software courses, for example, Photoshop, Excel and Word.

Some people say that they have been able to use what they've learnt to keep their books. A lot of people do it (a course) from a business point of view, or to keep their husband's books. I think most of the folk who do it do have a PC at home.

The courses have also assisted the ICT skills of people in local community groups, with group members now communicating extensively via email.

According to the Headteacher of Glen Urquhart High School, in post at the time when the new building opened and until July 2004 (see section 12.4.1), there were network security problems for adult learners wanting to access the FE college network. They had to access it through the school network which required them having to log in to the school server using passwords provided by the school. The college overcame this problem by installing their own computers with a dedicated firewall. This bypassed the school network so users could access the college system directly. When the college withdrew from acting as a learning provider at the centre, it gifted the computers to the centre for community use.

Adult learners have therefore used the college computers instead of those provided by the project, and have rarely used the videoconference facility. They have access to these eight computers for ICT classes. These are located in the open and distance learning (ODL) room which is located within the school area.

The community learning officer hopes to use an open area near the library as a potential study area, where computers could be located for adults to 'drop in' to use. In addition to the provision of ICT courses there are also two computers available for community use in the library on a separate 'people's network'. The advantage of these is that they allow access for users without having to go through the school network.

b) Further and higher education opportunities

With regard to the impact of the project in building partnerships with other educational/training providers, initially the FE college provided daytime ICT courses for adults through their outreach team, although it no longer does this, primarily for financial reasons, and the tutor has moved on elsewhere.

However, with regard to future opportunities, the community centre management committee is planning to register the centre as an ECDL testing centre, and also offer online distance learning courses, for example, 'Learning Direct'.

11.3.2 The users' perspectives - parents and adult learners

Only 18% (N=7) of parents indicated in the questionnaire that either they themselves or a family member had used the school/community centre computers, or undertaken courses learning how to use computers. These were mainly beginners' courses, for example, 'Computers for the Terrified'. These had clearly been of use as one parent was now undertaking further opportunities at a higher level.

Took 'Computers for Beginners', now doing ECDL. Very useful both for business and leisure, plus has kept me up with the 21st century.

When asked if there were any further courses they would like to be provided, seven parents indicated a wish to undertake further ICT courses in specific software training at either intermediate or more advanced level, for example, Photoshop, website design, computer aided design and advanced ECDL. Six parents indicated their interest in taking a beginner's course in either PC Passport, word processing, computer maintenance etc. Six parents also indicated their satisfaction with current provision.

Current facilities are sufficient for us.

They provide everything - most satisfied

However, one parent mentioned the need for increased access to facilities for users.

There are very good facilities available at the school. They should be made available to the community more often, although I know staff resources prohibits this to an extent.

In interview, two students who had studied computer courses reported that the quality of provision was 'good' and the teaching 'very good'. One student who indicated she was initially a complete beginner before starting a computer course, now uses ICT to support her bed and breakfast business, for example, advertising, sending emails etc. She also viewed access to computer courses as part of her long term strategy to gain ICT skills, and ultimately access to other employment opportunities when her children were older. Gaining computer skills had also assisted her in helping her children with their school-work.

11.4 Barriers to the Project

The difficulties in providing adult learning opportunities for the local community focus on technical, security and communication issues.

11.4.1 Technical issues

As already indicated in section 11.3.1, there were initially problems for adult users using computers for ICT courses due to the separate firewalls of the college and the school network computers. This has been largely resolved although there are occasions when users require external access through the school network, and they have to log in to the server using passwords provided by the school.

11.4.2 Security/user-friendliness of the building

Because the computers used for ICT courses are located in the ODL room within the school area of the building, this makes access less 'user-friendly' for adult users in the day time as they have to be 'signed in' and wear name badges. The Community Learning Officer thought that a 'drop in' facility would provide easier access for users.

11.4.3 Communication

As already highlighted in section 11.2, in the early days when the centre opened there were tensions between the school and community sectors working together for the first time in a shared building. It was felt by the community centre staff that communication had initially tended to be one way, from the school to the community centre, rather than a two way communication. The staff perceived this to have resulted in an unequal partnership between the school and community centre. Hence this perhaps explains why community centre staff seemed unaware of the original intention for the school and community to share the project ICT facilities. To some extent this is related to the security issues mentioned in section 11.4.2, and the school's concerns regarding adults being present in school areas of the building. As time has progressed, the communication between both sectors has improved and better working relationships established.

11.5 Facilitating Factors in the Success of the Project

The availability of ICT resources and provision of courses within the centre has now enabled users to access courses within the local community. Previously access incurred travelling some distance to their nearest provider for daytime or evening classes. The community learning officer reported that an important factor in the take-up of courses was the relatively low cost, which community members thought was good value, *'People often say this is great, not too expensive.'* Additionally, for the over 60's in the community an added incentive was the subsidised cost of courses.

11.6 Potential Areas for Further Development

11.6.1 Community centre staff

The Centre intends to register as a 'Learning Direct' Centre which will enable it to provide opportunities for community users to follow relevant online courses appropriate to their needs. Access to this would be via the PCs in the library and potentially by using computers in a 'drop in' study area.

11.6.2 Community centre users

With regard to the provision of additional ICT resources or facilities, an individual commented that greater flexibility of use and improved access to ICT resources, for example, the availability of the internet on the computers, and the individual use of laptops for study purposes would be of help.

Use of and provision for laptops to be issued to the public via distance learning courses.

11.7 Advice to Others

When asked to give advice to other local authorities and schools who might be considering similar joint school/community learning facilities, community centre staff suggested that it was important that at the planning and design stages of a building intended for joint school and community use, that consideration should be given to having the community provision completely self-contained to enable easier access, particularly during school hours, for adult users.

The staff also indicated that it would make sense for there to be facilities such as disabled toilets in the community side of the building as well as the school, together with a baby changing room. This would encourage use by adult users, including young families.

It was recommended that having a viewing gallery in the gymnasium would allow spectators access without damaging the floor through walking over it. Whilst it was acknowledged that

technology is constantly changing, it would be helpful to have up-to-date ICT facilities in the theatre, for example a wireless blue tooth system and IT ports built into the stage.

Staff also stressed the need for the different sectors (school and community) to work together at the outset of a new shared school and community provision, to create an equal partnership with good relationships and lines of communication.

11.8 Summary

- The provision of adult courses at the community centre has focused on leisure and learning opportunities for adults living in the wide geographical area served by the centre. These include an active arts/music programme, for example concerts, theatre, film club etc. in addition to a variety of community learning and leisure courses. (11.2)
- The community centre coordinator manages the venue and the community learning officer has responsibility for adult education, community development and youth work. The local FE college initially provided courses, but this provision was later withdrawn. (11.2)
- Initial tensions between the existing community provision and the school, have with time and changing senior management personnel, been overcome and closer collaboration and co-operation is being established. The Headteacher sits on the community centre steering committee, and weekly meetings take place between the Headteacher and community learning officer. (11.2)
- The project has provided the community with more access to, and the opportunity to improve their knowledge of, ICT. Courses provided include 'Computers for the Terrified' and 'Computers for Beginners', and ICT courses to support businesses, such as the European Computer Driving Licence (ECDL) and specialised software courses, for example, Photoshop, Excel and Word. (11.3a)
- The community centre management committee is planning to register the centre as an ECDL testing centre, and also offer online distance learning courses, for example, 'Learning Direct'. (11.3 / 11.6)
- Only 18% (N=7) of parents indicated that either they or a family member had used the school/community centre computers, or undertaken courses learning how to use computers (mainly beginners), and there were some requests for more advanced courses to be available. (11.3.2)
- The difficulties in providing adult learning opportunities for the local community have focused on technical, security and communication issues. (11.4)
- Advice to others setting up similar services included: the need at the planning stages to give consideration to the layout of the building taking into account the community users' needs, and ease of access, as well as the school's needs; and the need for the different sectors (school and community) to work together at the outset of a new shared school and community provision, to create an equal partnership with good relationships and lines of communication. (11.7)

SECTION 12

LOOKING BACK, LESSONS LEARNED AND ADVICE TO OTHERS - THE PERSPECTIVES OF THE LOCAL AUTHORITY AND HEADTEACHERS

12.1 Introduction

This section reports on the reflections of the local authority and the Headteachers at the end of the project, their overall assessment of the project, the lessons learned from its implementation and their advice to others considering implementing similar initiatives. It addresses elements of

Aim 1 - Assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools.

The data are derived from individual interviews conducted during May 2006 via telephone with the Local Authority ICT Manager who has responsibility for ICT infrastructure and support, the Headteacher of Ardnamurchan High School, the current Headteacher of Glen Urquhart High School (in post since August 2005), and the previous Headteacher of Glen Urquhart High School (2002-04). An acting Headteacher was in post between 2004 and 2005 at Glen Urquhart High School.

The purpose of the interviews was to determine their views of the key issues arising from the project's implementation, whether its vision had been achieved, the overall successes of the project, the facilitating factors, the barriers to achieving the aims of the project, and what advice the participants could offer to other local authorities and schools considering embarking on a similar initiative.

12.2 The Local Authority's Perspectives

12.2.1. The context

The ICT Manager was responsible for coordinating the provision of ICT resources and support to facilitate the educational aspirations of each school. A staff member with a remit for distance learning provision in the authority was involved in writing the bid to secure funding, although s/he has since moved on. Other staff have since taken responsibility for a similar but more encompassing remit, but there appeared to be no authority person with responsibility for curriculum support who had maintained contact with the schools. For the purpose of this report, the local authority's perspective is from the technical rather than the educational aspect of the project.

The ICT Manager indicated that the building of the two new schools provided an opportunity for the local authority to introduce the use of one integrated server system for both curriculum and administration purposes in each school. This is opposed to the system currently operating in the majority of its other schools, whereby the curriculum and administration systems are on separate servers. It was hoped that having a single server system would enable teachers to access the school systems at home via an internet connection to the school local area network. The intention had also been for pupils to have access to the school network at home. However, this vision did not come to fruition as the educational requirements of the project proved incompatible with the corporate governance division of the local authority who were unwilling to risk security of the network.

It was extremely frustrating because we could see areas where we could help the school and move things forward but our hands were tied.

Hence from the outset the local authority became aware it would prove impossible to achieve some of the project's aims, due to its existing service level agreement with the managed

service provider (MSP), the terms of which were primarily geared to supporting the corporate administrative systems.

The curriculum aspect of ICT support is managed by the local authority's own ICT unit. The introduction of the pilot project gave an opportunity for the MSP to be involved in both curriculum and administrative support. Whilst the MSP had agreed in principle to support the project, it required additional demands on the MSP above the requirements of its existing service level agreement with the authority. For example, the agreement terms meant the number of hours response time to deal with any technical problem was considered to be inadequate for the schools' needs, and there were often long delays before a problem could be solved. Due to the nature of the contract, although on-site technical support was available at each school, the technicians were not allowed access to the network to resolve particular problems. Their role was limited to carrying out simple routine tasks, for example, loading software onto machines.

12.2.2 Impact of the project - the overall successes

The ICT manager felt unable to comment on the educational experiences of the pupils. However, s/he commented on an awareness of raised pupil motivation and school ethos in both schools.

Certainly, well just raising the ICT skill base of teachers and pupils, I think it has been very successful there and motivationally. I have been down to visit the schools several times and it really is visible, the whole atmosphere. Okay they are new schools anyway, that's helped, but pupils walking about with their laptops and tablets, hunched in corners doing this and that in little groups. The whole atmosphere of it has changed and it's good.

12.2.3 Facilitating factors in the success of the project

Regular meetings were held every four to six weeks between the local authority ICT Manager, the MSP representative, the Headteacher and ICT Coordinator from each school. This enabled the Authority to monitor the ICT management needs of the project to ensure that the MSP was aware of ongoing technical issues that needed to be addressed. However, despite this the Authority acknowledged that the schools' needs were not always addressed as promptly as they required.

To ensure continuation of the project in Ardnamurchan High School, the local authority provided funding for the school beyond the two year period of FLAT support. This enabled it to purchase additional laptops for S1 pupils as they joined the school.

12.2.4 Barriers to the project

The ICT manager acknowledged that the Authority had not been able to help the schools to achieve their original aim of improving home-school links, primarily due to the terms of its contract with the MSP. The Authority view was that the MSP adopted a more business-oriented provision and its working practices were '*not geared up*' for supporting the educational sector. The Authority had been looking for flexibility from the MSP, but this inevitably incurred additional costs to the existing service level agreement. However, although the MSP had attempted to provide solutions to facilitate home-school access, these were not advanced due to the local authority's corporate governance personnel having concerns about security issues, i.e. the possibility of pupils accessing the Authority corporate network system.

The local authority's intention had also been to provide a single network for both school and community users. However, it was aware that due to the incompatibility of the school and learning providers' network systems (FE colleges and UHI), it proved impossible for adult learners at both school/community centres to access the learning providers' online learning resources. Time and effort was expended by the local authority in attempting to solve this

problem with the MSP but it incurred additional costs. Subsequently the community provision had to find its own solutions by paying for its own firewalls.

That kind of scorched the whole basis of our pilot because it should have been one integrated network and integrated access out, all managed as one. We were devastated when the managed service provider said “okay we can’t guarantee the access you want whenever you want it”. Whenever they asked for a change to the firewall, that involved charges, large charges.

12.2.5 Particular issues regarding the use of laptops

The local authority was aware of a number of issues that Ardnamurchan High School had to contend with which it had not anticipated at the outset. These related to difficulties which arose from pupils’ individual use of laptops. This was not an issue for Glen Urquhart High School as pupils did not have individual use of laptops. Having taken their laptops home to do school work, Ardamurchan pupils encountered problems with synchronising their work files from the laptop to the school network. This resulted in frustrations for both teachers and pupils.

There were a lot of issues about the way that they were using the laptops, having them taken home, that obviously had an effect on the operating systems configuration. They would bring them back to school, things wouldn’t synchronise, they wouldn’t work. Okay, often things don’t work, but as long as you can fix them quickly and make sure everyone is confident about that side of things and that is a major thing. But certainly to start with the MSP didn’t put in the time and effort to do that, so the school was left with laptops that couldn’t synchronise, wouldn’t work.

Additional technical difficulties for both staff and pupils related to the inadequate wireless network in Ardnamurchan High School. The ICT Manager indicated that ‘wireless had taken a very long time to get off the ground’. The local authority had also become aware during the course of the project that a lot of the Ardnamurchan pupils found the laptops heavy to carry around. Together with and the school it addressed this by choosing a different model, but taking account of a machine that was very light but also very robust. Tablet PCs were also introduced for some year groups.

12.2.6 Lessons learned and advice to other local authorities and schools

The local authority summarised the points below as essential lessons they had learned from the Highland Future Schools pilot project. The most fundamental of these related to its service level agreement with the managed service provider, and the issues which it believes require to be dealt with at the procurement stage. The need to:

- build in flexibility to the service level agreement with the MSP, to ensure it is affordable, but reduces additional on-going costs, and is more fully set up to meet educational needs;
- consider having more than one main MSP, as having only one is too restrictive;
- keep some element of support provision in-house, within the local authority.

Nothing could be changed, and if you wanted it changed then it was priced on the same basis as any corporate change would have been, which was just uneconomic. It was impossible to meet the costs of any change that we wanted made, so I think that would be a major lesson that we’ve learnt for the future – certainly having one big contract, one supplier for practically everything is not the way forward. I think we need to think far more carefully about exactly what we want, what’s better done in-house, what’s better done by a contractor, which bits you do need to have covered on a very standard basis that you pay for, they fix it, and which bits you need flexibility on, so you need to do a lot more work on that instead of just going along with standard industry terms and conditions because education is just so different.

The local authority acknowledged that in hindsight it should have tested out the project's requirements in advance to see if they matched the school's expectations. There was a realisation that the teachers and pupils had borne the brunt of the technical problems that had heavily impacted on their day-to-day use of ICT within the school.

It's been a huge, huge learning experience this project.....We need to test these things out better and be clearer about what we can expect.

However, the local authority also emphasised the importance of trying to ensure that the participants' expectations of what is possible in pilot projects are realistic.

I think it was expectations too, because at the time as well, it was a brave new world, a laptop for everyone, wireless everywhere, but I think expectations were probably set too highly there too, but then you don't want to damp expectations in an educational environment.

When asked what advice the authority would offer to other local authorities considering implementing similar initiatives for joint school and community provision, the ICT manager advised that a local authority would need to be very careful about the contract entered into with the managed service provider and the level of service it provides. It was considered important for a local authority to retain control and provide the technical support as much as possible in-house, as the Authority staff understand the schools' needs and their vision.

However at a level beyond the local authority, it was felt that for future innovative developments using ICT in schools to be successful, there is a requirement for the IT systems industry to begin to understand the infrastructure and needs of schools relevant to ICT use, and to provide solutions that meet their educational needs.

Our requirements on the education side really knock up against industry standard ideas in many ways. Now obviously we want to stick to industry standards and that's one of things that we are doing moving more towards that, and I think Becta have done a lot of work recently on that side, trying to specify infrastructure that schools would have and standards that should be employed. But also making the industry aware of what is needed in education. That flexibility has to be built in at the start, and has to be taken account of at every step of the way, otherwise it is just not going to work in an affordable way, and we can't afford to lose the teachers along the way by frustrating them in this sort of way.

An important issue regarding the pupils' individual use of laptops that was raised by the Authority ICT Manager, is the need to ensure that the equipment purchased, e.g. laptop/tablet PCs, is fit for purpose and robust enough for use in schools.

12.3 The Perspectives of the Ardnamurchan Head Teacher

The Headteacher acknowledged all the technical problems that the school had incurred, and its disappointment that it was unable to achieve its aim of home-schools links with the pupils accessing the school's intranet via their laptops at home. However, despite this she remained very positive about the use of ICT in schools, both for its administrative and curricular use.

12.3.1 Impact of the project - the overall successes

The Headteacher reiterated the views already expressed in sections 2.4.1 and 2.4.2. For the pupils, the project had facilitated a broad, balanced, varied and rich curriculum and increased pupils' ICT skills, motivation, and engagement with learning. The pupils were ICT literate, using it at home as well as at school. She acknowledged it was difficult to measure whether using ICT had raised achievement, but thought that having access to an ICT-rich environment had enhanced teaching and learning.

I think having access to ICT and the internet has definitely been of huge benefit and I would recommend that to any school, to have an ICT rich environment if possible for learning.

The Headteacher expressed strong support for the community to use the school's ICT facilities.

12.3.2 Facilitating factors in the success of the project

The Headteacher highlighted the strong commitment of the Authority, which was supporting the project by continuing to fund the provision of laptops (on lease) for three years following the two years of FLAT programme support. Additionally, support was given to the project via regular meetings and email contact to solve ongoing technical difficulties. It was acknowledged that at the outset neither the school nor the local authority had fully appreciated the level of the undertaking.

12.3.3 Barriers to the project

The Headteacher reiterated the local authority's view that the main barrier to achieving the aims of the project had been the restrictions in the Authority's existing service level agreement contract with the MSP. As documented elsewhere (see section 2.5), there was a lack of understanding by the MSP of the school's specific needs, and a lack of understanding in general, of education's ICT needs. This resulted in the provider being unable to respond to the school's needs which impacted on the school in a number of ways:

- a long delay before ghost imaging became available;
- an inadequate wireless network in the school to support laptop use;
- an inadequate level of technical support.

The number of technical staff present in the school, 1FTE (0.5x2), was viewed as totally inadequate to support the number of laptops in daily use. Although the school had been well supported by the local authority in terms of ICT support, it had received no substantial support to assist teachers to integrate ICT into the curriculum.

12.3.4 Future developments

The early stages of the project required the school's energies to be focused on troubleshooting and addressing the technical issues. The Headteacher is aware the project is still a '*journey to be undertaken*', with the intention that the next stage will concentrate on integrating ICT into the curriculum, and providing support and staff development to assist this process.

In light of the technical difficulties incurred, the senior management team are now considering whether in future years to have the laptops as an additional general resource in a classroom together with the desktop PCs. Also under consideration is whether to give a laptop to only the senior pupils as a personal resource, rather than giving a laptop/tablet PC to every pupil.

12.3.5 Lessons learned and advice to other local authorities and schools

In the early stages of this pilot the school and senior management team focused their energies on addressing the developing technical issues. In hindsight, it is felt that it would have been better to have concentrated on developing the school website as a means of communication with parents, instead of focusing solely on the project aims.

It was recognised that whilst the preferred scenario would be for each pupil to have an individual laptop, it was thought to be unrealistic and sustainable in the long term, due to an increasing school roll each year, insufficient technical backup and an incomplete wireless network installed throughout the school.

I think if the children have been given laptops that had wireless and worked from day one and didn't have problems of logging on and not being able to set up, if they'd not

had technical problems it would have been a different story. So from one point of view it's been good, because we've seen for other schools that you cannot go on with this experiment without having huge technical backup. Really it's impossible unless you have a wireless system, I don't think it is worth doing unless you have wireless.

When asked what advice the school would offer to other schools considering implementing the use of personal mobile technologies for pupils, the following technical matters were considered essential in the planning stages:

- install a complete and powerful wireless network;
- introduce technologies designed specifically for schools;
- introduce systems for the management of the computers e.g. ghost imaging;
- get commitment to technical support onsite so that a proactive approach can be taken as problems emerge;
- commit to meet software as well as hardware costs;

The willingness of the staff to engage in, sustain activity and be mutually supportive in such an innovative initiative is considered to be of vital importance. Being a new school the staff were also enthusiastic and with a willingness to learn. Central to this is the need to support staff during the process through a variety of means including peer support, staff training, inset, NOF, and voluntary CPD. Having a number of key people in the school with a high level of ICT skills constituting a 'core of experts', has proved valuable for the project.

With regard to the laptop/tablet PCs used by the pupils, it was felt there is a need for the ICT industry to develop more robust, child-proof, mobile technology that is suited to heavy use in schools.

12.4 The Perspectives of the Glen Urquhart Head Teachers

12.4.1 Impact of the project - the overall successes

Both Headteachers interviewed were not in post for the duration of the project. They were not in a position to give an overview of the project from its inception to its current stage. Therefore, this account may not fully reflect all the activities that have been implemented in the school.

Prior to the new school being built, the only ICT resources available in the old school (a collection of huts) were very limited. The new computers and laptops provided by the project considerably increased the opportunities available to the pupils. Laptops could also be borrowed from the library. The increased access to using ICT brought about an increase in pupil motivation and stimulation with learning. It also assisted the quality of materials produced by pupils.

Due to the previous lack of resources, the staff had had little opportunity to use ICT and develop their skills. The project has aided their familiarity with ICT, and development of ICT skills, ultimately enhancing their teaching. Having a laptop for personal use has increased the flexibility and mobility of working for staff, and enabled them to make more relevant use of ICT in their lessons. Overall it was felt the project had considerably improved the quality of the teaching and learning.

Prior to the new school/community centre being built adult learning opportunities had not existed. The Headteachers indicated that the opportunities for the community use were still not as well developed as they hoped, partly due to the technical difficulties already documented in sections 11.3.1 and 11.4.1. Adult learners were unable to access the FE college intranet in the early days of the project. Furthermore, the college has also withdrawn from offering courses. However, one member of the school staff has run an evening course in

ICT for adults, for example, the use of Photoshop software package. Also adults in the community have been able to access to computers in the library which have internet access. The Headteacher welcomed adults using the building, but had concerns regarding security issues and the need for people to be signed in and wear a pass.

12.4.2 Facilitating factors in the success of the project

Support was given to the project by the local authority via regular meetings and email contact to solve ongoing technical difficulties.

12.4.3. Barriers to the project

Similarly to Ardnamurchan High School, Glen Urquhart had from the outset of the project incurred the restrictions imposed by the MSP, resulting in home-school links being unable to be established. The pupils were unable to access the school intranet, for example, for homework, and staff were unable access their records at home.

There are still ongoing problems and firewall issues in the school, such that both the pupils and staff are unable to access some software and websites. The school was due to have a new server installed in June 2006 and it was hoped most of the problems would be resolved.

12.4.4 Future developments

With regard to future use of ICT in the school, it was envisaged making increasing use of interactive whiteboards for use in teaching. It was felt this resource helps to engage pupils and gives them a more practical learning experience.

We are looking to develop the use of interactive whiteboards technology even further, we are increasing the numbers in school.in pupil engagement and that kind of technology, making it a much more hands on practical kind of learning, that's one aspect.

It was hoped staff could have more preparation time to investigate the possibilities of using websites and online learning resources for teaching. However, this was hampered by the level of staffing allocation which meant there was little flexibility to allow this. It was acknowledged that staff still needed help with their ICT developmental needs.

As far as the use of software, where there are gaps we are able to make arrangements to fill that. I think (the needs are) more in terms of appropriate learning and teaching strategies that incorporate ICT, rather than necessarily relying on ICT as a delivery medium.

Whilst the present Headteacher recognised the development of ICT strategies would continue, he also highlighted the central role of the teacher as being crucial to learning and teaching.

For me it's a bit of balance, I don't want the development of the use of ICT to become the central most important part about learning and teaching. I still think the teacher is the most valuable resource and it's important that we make sure that ICT is a balanced part of that.

A major concern of the school is the replacement costs of the project equipment, and this issue is still to be discussed with the Authority. The equipment for the project was originally purchased. Future developments should now consider the ongoing replacement and maintenance of the hardware facilities.

With regard to the community use of ICT, the Headteacher has initiated more regular communication between the school and community staff to deal with problems.

12.4.5 Lessons learned and advice to other local authorities and schools

The Headteacher in charge when the school opened reiterated the view of others that it is essential in the planning stages to take time to sort out the configuration of the school network system. He also recommended establishing and maintaining good relationships with visiting technical support staff, and having a dedicated person from the MSP who understands the problems, to work with the school.

12.5 Summary

- The ICT Manager indicated that the building of the two new schools was an opportunity for the Authority to introduce one integrated server system for both curriculum and administration purposes in each school. However, this initial vision did not come to fruition, as the educational requirements of the project proved incompatible with the corporate governance division of the local authority. (12.2.1)
- Both Headteachers highlighted the commitment of the local authority. (12.3.2/12.4.2)
- The local authority ICT manager held regular meetings with the MSP representative, Headteachers and ICT Coordinator from each school to attempt to solve ongoing problems. Despite its best efforts, the local authority was aware that the schools' needs were not always addressed as promptly as they required. (12.2.3)
- Both Headteachers very positive about the use of ICT in schools, both for its administrative and curricular use. (12.3.1/12.4.1)
- They considered that the project: had facilitated a broad, balanced, varied and rich curriculum and increased pupils' ICT skills, motivation, and engagement with learning (12.3.1); brought about an increase in pupil motivation and stimulation with learning, and had assisted the quality of materials produced by pupils. (12.4.1)
- Access to an ICT-rich environment had enhanced teaching and learning (12.3.1/12.4.1); and laptops for the teachers' personal use has increased the flexibility and mobility of working, and enabled them to make more relevant use of ICT in their lessons. (12.4.1)
- Local authority advice to other schools and local authorities included the need to: build in flexibility to the service level agreement with the MSP; to ensure it is affordable, and is more fully set up to meet educational needs; keep some element of support provision in-house, within the authority; test out the project's requirements in advance to see if they matched the school's expectations. (12.2.6)
- The Headteachers' advice to other schools included the need to: in the planning stages sort out the configuration of the school network system; introduce technologies designed specifically for schools; establish and maintain good relationships with visiting technical support staff; have a dedicated person from the MSP to work with the school; and local authority commitment to meet software as well as hardware costs. Additionally, where mobile technologies are introduced for pupil use there is a need install a complete and powerful wireless network. (12.3.5/12.4.5)
- The Headteachers expressed support for the community to use the schools' ICT facilities. One indicated opportunities for community use were still not well developed. (12.3.1/12.4.1)

SECTION 13

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

13.1 Introduction

In this final section we discuss our overall findings and make recommendations to the local authority and schools about actions that we think could assist them in the project's development. We then list the successes of the project, the barriers to success and some future developments. Finally, we present a summary of findings for the four evaluation aims, our conclusions and recommendations which we think would assist other local authorities and schools considering introducing similar joint school/community centre initiatives, and the use of personal mobile technologies for pupils.

13.2 Discussion

13.2.1

The HFS Project provided additional ICT facilities, including laptops for teachers in both Ardnamurchan High School and Glen Urquhart High School, and laptops for all pupils in Ardnamurchan High School, to enhance the learning and teaching experience for both the staff and pupils. ICT was the focus and driving force of this project. However, from its outset the local authority's, Headteachers' and distance education staff's vision faced serious barriers to its implementation. This was because it was impossible to reconcile the educational intentions and aspirations, with the priorities of those in the local authority who had responsibility for corporate governance and ICT security aspects; and the terms of the service level agreement with the managed service provider.

Although united under the umbrella of 'The Highland Future Schools Project' (HFS), the aims of each school had a slightly different focus at the outset, and the project has developed in different directions in each school and community centre. We draw together key issues from the project overall, and acknowledge that not all the issues we discuss may pertain to both schools.

13.2.2 The local authority

As already indicated throughout this report, one of the unachievable project aims was home-school links: allowing teachers and pupils access to the school intranet. If local authorities want schools to be part of 21st century, incorporating ICT to deliver teaching and learning to future generations of children, how do they ensure that a service provider understands their educational needs as well as the corporate needs? This is clearly a question that needs to be addressed with the IT industry. From our discussions with the local authority, it clearly recognises this, as well as the need when planning new joint school and community provision, to test out the use of mobile technologies for pupils before introduction for whole-school use, and also to test the feasibility of shared ICT systems between the school and community sectors.

It is also important for a project which has ICT as its focus, and is evolutionary and developmental in its nature, to be funded for sustained development in the long term. Amongst all its competing financial priorities the local authority needs to support the project through expenditure on maintenance and replacement equipment, as well as ongoing technical support.

13.2.3 The schools

In the schools the teachers were enthusiastic in their use of ICT for administration purposes and found it aided their efficiency. However, the level of ICT use for teaching purposes was varied, with it being used more heavily in some curricular areas than others. There was a variety of experimental and innovative uses, with some teachers being more enthusiastic than

others. Teachers highlighted the potential of ICT for pupils and the opportunity to create independent autonomous learners, but generally the use of ICT in the classrooms was largely determined by the teachers.

Perceived limitations of the schools' ICT systems, problems with reliability and on-going maintenance and support, were crucial factors in determining ICT use for teaching purposes. There is a need for more powerful and robust school ICT infrastructures to deliver the learning vision. Although the ICT training was well received and teachers thought their ICT skills and competence had improved over the duration of the project, lack of time to try out new ideas before use in the classroom was cited as a barrier to use. Also, not surprisingly teachers were reluctant to use ICT with pupils, before they felt fully in control, if it was likely to create difficulties, disrupt routines or detract from rather than enhance the educational experience of their pupils.

Even assuming that the technical difficulties could be satisfactorily resolved, the schools and staff need support to assist them in developing and embedding ICT into the curriculum. Currently the local authority, which covers a large geographical area, does not have the staff or resources to assist schools to do this. It appears to only offer curricular support in limited subject areas, for example, special needs.

There has been considerable investment in ICT infrastructure into education in Scotland (LTS NGfL Scotland, 2006), and the introduction of GLOW (the new name for the Scottish Schools' Digital Network), will provide a national intranet for all Scottish schools and a powerful channel for the delivery of resources and rich learning opportunities. However, for teachers to invest their time and energy in using ICT, it is essential that the infrastructure is fit for purpose; that there is ongoing technical support available to schools as it is required, not days or weeks later; and teachers get help with developing and embedding ICT into the curriculum. Until these issues are resolved it is unlikely that ICT will be fully integrated into teaching practices, and that further opportunities will be opened up for pupils to take greater responsibility for their own learning.

In planning such a project it is important for schools, together with the local authority, to undertake a risk analysis, build in dedicated project management support, consider the likely challenges that might arise and how they might be dealt with, so that other possible avenues may be explored if the original aims cannot be pursued.

13.2.4 Use of mobile technologies in school

It is clear that the technical difficulties experienced by Ardnamurchan High School: an inadequate level of technical support; an inadequate wireless network in the school to support laptop use; and the long delay before ghost imaging became available, contributed to the use of laptop/tablet PCs by pupils not being routinely established in the majority of classes.

The technical difficulties/delays logging on to laptops and time wasted by pupils doing this at the beginning of lessons, the problems with synchronisation of files between home and school meant that it was sometimes easier for pupils either not to use the laptop/tablet PC, or prefer to use a desktop PC. Hence the use of the laptop/tablet PCs by pupils was not as frequent in school as it could have potentially been, considering that each pupil had one for their own personal use. Pupils also complained about carrying it around if was not being used in the lessons each day. This resource will only be used to its full potential if the pupils have an expectation it will be used, and the school systems working are fully fit for purpose.

The tremendous potential of mobile technologies to assist and empower pupil learning will remain only a vision unless the technical issues are sorted out when local authorities and schools are in planning stages of such an initiative, and the systems are in place to support this, particularly the issue of the service level agreement with the managed service provider.

Only then can it provide a problem free environment which gives teachers and pupils the opportunities to explore the learning potential of ICT and laptop use.

13.2.5 Community provision

The new buildings brought facilities, resources, and learning opportunities to the community which were well received by the users. Some of these were previously inaccessible without users travelling long distances. However, the community centre staff all commented on the long-term nature of establishing and embedding adult educational and social provision into communities, both where there had already been limited provision and also where none had previously existed.

The need for security measures imposed by the school to ensure the safety of its pupils, impacted on the community's use of the shared building during the daytime when the school was open. For example, users have to wear name badges and 'sign in' which does not create a user-friendly environment and discourages adult access. In planning future joint school/community buildings the local authority should consider at the planning and design stage to incorporate a separate entrance/access for community users with its own facilities. If the vision is a truly seamless integration for learners from school to further, higher and adult education, then for adults to feel empowered all sectors need to work together to ensure the building provides a centre which meets everyone's needs.

Consideration also needs to be given to the feasibility of shared ICT systems between both sectors, and ensuring equal access to ICT for both school and community users.

13.2.6 Recommendations to the local authority and schools

Much has been achieved within the project so far, with the benefits identified in section 13.3.1. Following on from the issues raised in sections 13.2.2-13.2.5, we suggest ways of resolving the technical issues, so that the schools can build on what they have achieved so far.

Addressing technical problems

The need to align and balance opportunities and challenges in and around the use of ICT and learning in the HFS Project, suggests that management teams should consider the following:

- Together with the local authority address the fact that current MSP arrangements inhibit the use of portable devices and create artificial barriers to easy use in school and at home.
- Creating lesson start-up routines and procedures which pre-empt problems of portable computer connection to networks.
- Managing reliability problems to reduce their impact on learning and classroom routines. This may be possible within existing arrangements and within a renegotiation of the managed service agreement under which ICT is provided.
- Achieving an appropriate blend of desktop and portable computer availability to maximize the flexibility and cost effectiveness of provision.

13.3 The Project Successes, Barriers and Future Developments

It is important to recognise what both schools have been able to achieve in this project, the barriers they faced and their intentions for the future.

13.3.1 Successes

The project has been successful in achieving the following:

a) School

- For both the teachers and pupils there are benefits in the form of increased ICT skills and confidence.
- Increased pupil motivation and engagement with learning.

- The provision of an enriched curriculum through access to resources and information.
- Increased use of innovative teaching and learning approaches.
- Increased efficiency in management, administration and reporting.

b) Community Centre

- Provision of ICT facilities, resources and learning opportunities previously unavailable to the community.

13.3.2 Barriers

a) School

From the views put forward to us, it is clear that whilst the schools welcomed the opportunity to try out new ideas, there have been a number of challenges and potential barriers to success. These are predominantly technical matters:

- The non-availability of a wireless network to support use of portable computers in school.
- The impossibility of connecting to the school network for using laptops/computers at home (for security reasons).
- The mismatch of educational and corporate expectations, and facilities offered under the terms of the existing managed service provider contract.
- The lack of bandwidth and software reliability experienced, and problems with the speed of response and repair when problems were encountered.
- Insufficient levels of technical support staff to deal with maintenance and trouble shooting.
- The lack of a fully efficient schools' educational network administration system.

Another barrier to the use of ICT, not related to technical issues, is:

the need for staff training in ICT skills, and ICT-related support in their curricular area.

b) Community Centre

It appears that all concerned believe that it is a long-term process establishing community provision, particularly within a community that had no previous centre/building. The following issues were raised as barriers to shared school and community provision:

- Incompatibility of firewall systems between the community and school caused problems for FE and HE providers.
- The different needs of the school (security) and the community within the shared building impacted on user-friendly access for community users.
- Unequal partnerships in the early days of the project between community centre staff and the school.

13.3.3 Areas for future development

a) School

i.) Integrating ICT into the curriculum

With regard to the use of ICT, it is evident that in the early stages of the project much of the energy and focus of the local authority and senior management team has been on addressing technical problems, particularly with regard to the pupils' personalised use of laptop/tablet PCs in Ardnamurchan. However, we are aware of the innovative practices that teachers have introduced. The management and teaching teams in both schools involved in the project are aware that in the next stage they will be continuing to move forward to integrate ICT further into the curriculum. To do this both schools will be dependent on the provision of support and staff development from the local authority and senior management teams.

ii.) Pupil empowerment

It was evident that the use of ICT, specifically desktop and laptop/tablet PCs, by the pupils in classes was generally under the control of the teachers. However, pupils in the senior classes (S5/6) indicated that they had increased use of the laptop/tablet PC, and were given more autonomy over the decision when to use it.

iii.) Use of mobile technologies

The Ardnamurchan High school senior management team is now reassessing its vision of one laptop/tablet PC per pupil due to the technical difficulties encountered. It is considering whether to restrict the personal use to senior pupils and have the remainder as an additional resource in each classroom.

b) *Community Centre*

The Glen Urquhart community centre hopes to further its adult education provision by registering as a 'Learn Direct' Centre. From a users' needs survey it also intends to identify courses to meet the community needs.

The Ardnamurchan community centre would like to offer learning opportunities, for example, vocational qualifications for school leavers not going to university. It is also looking to develop and offer short courses/tutorials for adults on aspects of environment studies and art, of relevance to the local community.

13.4 Summary of Findings

We present a summary of our findings based on data collected from the school senior management teams, teachers, pupils, parents, community centre staff and users, and the local authority.

Aim 1

The assessment of the overall impact of the project on teachers, pupils, parents and other stakeholders associated with both schools.

a) *The local authority*

- The Authority provided the ICT infrastructure and resources necessary to set up and maintain the project in both schools. However, it was constrained by the existing service level agreement with the MSP, which allowed it very little flexibility to support the schools.
- Despite the Authority's best efforts and regular communication with the schools it was often unable to promptly resolve many of the ongoing technical problems experienced by the schools, for example, the restrictions on access to the school intranet due to the terms of the agreement with the MSP.
- The Authority acknowledged it had not anticipated some of the problems, for example, synchronisation of files, which arose from individual use of laptop/tablet PCs.
- The ongoing costs of laptop provision for Ardnamurchan High School were borne by the Authority.
- The Authority was aware that such a heavily ICT resourced project required some commitment to sustain it in both schools, with a need to continually upgrade resources.

b) The school/senior management team

- The schools benefited from the provision of new ICT resources and facilities for teaching and learning.
- The school/senior management teams were supported by the Authority, but prevented from achieving certain aims, i.e. home-school links, due to the terms of the Authority's existing service level agreement with the MSP.
- The schools were dependent on the Authority to sort out the variety of technical problems which ensued.
- The schools were constrained by a lack of onsite technical support which prevented them from taking a proactive approach to problems as they arose.
- The schools had concerns about the replacement costs of the desktop and laptop/tablet PCs when newer models were required.
- Ardnamurchan High School was supported by the Authority to enable it to lease laptops after the two years of SEED support ended.

c) The teachers

- Use of a personal laptop gave teachers the flexibility of use between school and home. It assisted teachers in the preparation and presentation of teaching material and administration tasks.
- Technical difficulties hindered the project's development, such that the impact of ICT has been varied and perhaps slow to effect a change in pedagogy. Some departments for example, technology in Ardnamurchan High School, had made significant advances in the use of ICT.
- Ardnamurchan teachers incurred additional problems to the Glen Urquhart teachers due to the pupils using personal laptop/tablet PCs: the technical problems; time delays in class logging on to the server and no guarantee that all pupils would bring the laptop/tablet PCs to the class.

d) The pupils

- The enhanced ICT resources increased pupils' ICT skills, motivation and engagement with learning.
- The use of ICT provided an enriched curriculum for pupils.
- ICT provided easy access to resources for pupils, a curriculum and resources better targeted to different styles of learning.
- ICT offered opportunities for pupils to learn independently/take responsibility for their own learning. However, the use of ICT by pupils was predominantly determined by the teachers.
- ICT enhanced presentation of work, and was an aid to revision: providing revision summaries which saved pupils time from having to write their own notes.
- Personal mobile technologies have the potential for furthering pupil independence and ownership of learning.
- Use of the internet distracted pupils from tasks because they visited non-relevant sites, and using ICT also wasted pupil time due to delays in logging in/starting up machines.
- Some pupils were more interested in the use of ICT to aid presentation of their work rather than its content.
- Pupils were unable to work seamlessly between school and home because they could not routinely access materials from the school intranet.
- The use of ICT has the potential for health and safety issues due to pupils sitting in front of computers for long periods of time.

Laptop/tablet PC use

- The lack of network connections, unreliability of the laptop/tablet PC, the unavailability if it was being repaired, and various technical problems resulted in pupil de-motivation and frustration.
- Pupils also voiced frustration if the laptop was not frequently used, mainly as it was considered to be too heavy to carry around all day.

e) The adult learners/community users (including parents)

- The opening of the new buildings brought facilities and resources, learning opportunities to the community which were previously inaccessible without travelling long distances.
- Incompatibility of firewall systems between the community and school caused problems for providers.
- There appeared to be some lack of clarity in the communication between school personnel and community educators around ownership and access to ICT equipment, in particular during the early days of the project at Glen Urquhart High School.
- The location of ICT equipment within the school building raised issues of safety if members of the public were using equipment during the day. This caused some tension between the different needs of the school and the community within the shared building, with the former looking to ensure safety of its pupils, and the community facility wanting to encourage adult access in a user-friendly manner.

Aim 2

The identification of what, if any, impact the project has had on attainment, achievement, attendance, motivation, school ethos, planning and the learning and teaching environment.

a) Attainment, achievement, motivation and attendance

- With respect to raising achievement, qualitative reports from teachers, pupils and parents indicate that using ICT has had a positive impact on pupils' motivation, enthusiasm for and engagement with learning, and has raised the level of pupils' ICT skills.
- Over three quarters of teachers strongly agreed/agreed that '*using ICT leads to raised attainment for many pupils*'. However, they felt unable to provide hard indicators for this.
- In order to assess whether the personal use of a laptop/tablet PC by pupils had made any impact on attendance, the quantitative data collected by Ardnamurchan High School on pupil attendance and behaviour was scrutinised. The data presented an inconclusive picture. It is also difficult to make any claims as to the impact of the project on attendance, as other variables/school initiatives may have had a greater impact.

b) The learning and teaching environment

- The project has enabled the two new school buildings to be equipped with state of the art technology.
- For Glen Urquhart High School it has enhanced provision compared to the previous lack of ICT equipment in the old school building.
- For Ardnamurchan High School it has provided ICT resources and facilities in a location where previously no high school existed.
- The ICT facilities and resources include personal laptops for all staff in both schools, and personal laptops or tablet PCs for pupils in Ardnamurchan High School; interactive whiteboards and data projectors in some classes; suites of

desktop machines in ICT, graphic communication, and videoconferencing equipment.

Aim 3

The assessment of the project's impact in improving home-school and community links and building partnerships with other educational/training providers

a) Home-school-community links

- The intention to provide home-school links through the use of ICT for teachers and pupils, with teachers and pupils accessing work from the school intranet, proved impossible for the MSP, local authority and schools to achieve, due to a combination of technical and network security reasons (see sections 2.3.1 and 7.3.1).
- One aspect of ICT use beginning to be introduced by some teachers was the use of email for communication with parents. This has supported links between home and school.
- Similarly, the aim to improve school-community links for the adult learners and community users was hampered for network security reasons, with the managed service provider being unwilling to allow external access to the school network. This resulted in the partner providers or community staff having to install their own firewall systems.

b) Building partnerships with other educational/training providers

- The level of success appears to have depended to some extent on how the partnership arrangements were initially established when the centres opened.
- The development and sustaining of partnerships has proved to be more successful at Ardnamurchan High School, where initially personnel were employed on a joint local authority/FE partnership which helped to establish a firm FE presence. Even here, according to community centre staff it has taken many years to 'bed in' community provision.
- The local FE college withdrew support from the Glen Urquhart community centre, probably for financial reasons, by not replacing a staff member who left. The attempt to secure ongoing FE provision opportunities was due to the efforts of the community learning centre officer who was employed by the local authority.

Aim 4

The identification of what, if any improvements the use of ICT has made in terms of developing and delivering greater learning and teaching opportunities for teachers, pupils and adult learners.

a) The teachers

- The use of ICT helped to develop and deliver greater learning and teaching opportunities for teachers.
- All teachers reported they use email to network and conduct professional exchanges with colleagues in their subject areas, and half indicated they are already participating, or beginning to participate, in online discussion groups.
- Less well developed is their use of ICT for their own professional development, for example, taking a CPD course online, (reported by up to one third), although more teachers (up to a half) were thinking of doing so in the next one to two years.
- The project provided support for ICT training that has helped the teachers improve their own ICT skills, and this has impacted on their teaching practices.

- Teachers now use a variety of ICT technologies: personal laptop; data projector; and an interactive whiteboard. The teachers have used ICT to create and edit their own learning materials, particularly differentiated materials.
- The data projector and interactive whiteboard enabled them to produce more visual and interactive materials. This included the use of image projection on the interactive whiteboard to enhance explanations of three dimensional or dynamic concepts.
- The use of the internet has enabled teachers to access key resources and information from specific curriculum websites. It also provided access to some ODL (online distance learning) courses and enabled the schools to now offer and deliver new courses which previously would not have been available for pupils.
- Teachers have used ICT principally as a tool to improve their existing teaching and learning practices. There was an acknowledgment that further support and training are needed to fully integrate ICT into the curriculum, and further develop more flexible and novel approaches to teaching and learning.

b) The pupils

- ICT has provided the pupils with access to greater learning opportunities. The internet has improved access to key resources, and the availability of online learning materials, for example, Scholar.
- Online learning materials together with self-assessment software have allowed pupils to learn independently and receive feedback on their performance.
- In some subject areas the use of simulations, animations etc. enabled pupils to experience learning more visually, for example, the rotation of chemical molecules, or to run experiments which are not practical to do in the classroom.
- ICT helped to remove barriers to learning for those with literacy difficulties and opened up learning opportunities via email communication with schools overseas.

c) Adult learners/community use

- The provision of greater learning opportunities has been mixed and has evolved at different rates at each school.
- The uptake of higher and further education learning opportunities by the community has proved more successful at Ardnamurchan High School. Students can access lectures/tutorials from the local FE college via videoconferencing, and access online courses from the UHI Millennium Institute.
- The adult learning opportunities were less well developed in Glen Urquhart High School. Whilst the intention of the school was to '*create a local learning and communications web across all areas of the local communities served by the school*', this has been limited, partly due to the local FE college being unable to sustain a presence and provide learning/training opportunities locally for students.

13.5 Conclusion and Recommendations

The Highland Future Schools Project is best represented as a journey still being undertaken. Like many educational developments it is more evolutionary than revolutionary in character. Some of the project aims were rendered unachievable by circumstances, whilst others are still in development. It will take a considerable time for the project to become fully embedded in the schools, and for them to achieve all their aspirations.

The increasing use of ICT in schools, which potentially brings opportunities for pupils and teachers to work seamlessly between school and home, requires a level of ICT infrastructure and support that is beyond that which local authorities can offer on their own.

The HFS Project highlighted a number of tensions and difficulties in and around the provision of reliable and effective computer and network services for teachers, pupils, schools and communities. Until these problems are resolved, schools, teachers and pupils will find it difficult to use ICT to its full potential for teaching and learning purposes.

The arrival of GLOW, the Scottish School's Digital Network will provide a new context in which these tensions and difficulties can be addressed and hopefully resolved. Glow is funded by the Scottish Executive and managed by Learning and Teaching Scotland (LTS) in partnership with RM. It will provide a single integrated intranet service linking 800,000 educators and pupils across the nation. The development and provision of the intranet will be managed as a partnership between the providers, every local authority and schools.

The initiative will provide Scotland's school education community, for the first time, with a powerful network infrastructure, a broadband network, software to support collaborate learning and development and a virtual learning environment. However, the evidence from the HFS Project suggests that issues of alignment between national, local authority (including corporate and educational ICT divisions), external third party ICT providers and schools will have to be addressed in detail if the GLOW network is to be fully successful.

On the basis of our findings, the lessons learned, innovations observed and advice suggested by each group of stakeholders, we make the following recommendations to other local authorities and schools considering undertaking similar initiatives, both the provision of laptops for teachers and/or pupils, and joint school/community provision.

13.5.1 The Local Authority

Should:

- build in flexibility to the service level agreement with the MSP to ensure it is affordable, but reduces additional on-going costs, and is fully set up to meet educational needs;
- keep some element of provision of ICT support in-house;
- conduct a risk analysis at the planning stage, and have contingencies available if original intentions do not go according to plan;
- be aware that an ICT project requires not just one-off costs, but a commitment to sustain it, including the upgrading and replacement of equipment;
- consider leasing rather than purchasing laptop/tablet PCs;
- provide an ICT infrastructure in schools fit for purpose;
- test out the ICT systems in a limited pilot, particularly when using mobile technologies, before introducing to the whole school;
- contribute to effective project management;
- provide good technical support to the school;
- develop a good working partnership with the school;
- regularly communicate with the school to monitor and review the process;
- provide training, support and advice to schools for the integration of ICT into the curriculum;
- in the planning stages seek reports/research evidence of similar initiatives in other schools/local authorities;
- in the planning stages when designing a building for joint school/community use, consider the differing needs of school and adult users, both in terms of access and security;

- keep a written record of decision taking etc. for continuity in case staff leave their position.

13.5.2 Schools and the Senior Management Team

Need support from the local authority to provide:

- a powerful and robust infrastructure to deliver learning and teaching visions;
- reliable and up-to-date equipment which is fit for purpose;
- ongoing technical support;
- an effective ICT infrastructure to support mobile technologies;
- help with integrating ICT into the curriculum;
- funding for up-dating/renewing of equipment as necessary.

Should:

- conduct a risk analysis at the planning stages, and have contingencies available if original intentions do not go according to plan;
- in the planning stages seek reports/research evidence of similar initiatives in other schools/local authorities;
- be flexible and if original intentions are not possible, consider and implement contingency plans rather than pursue a lost cause;
- communicate regularly with all relevant parties, e.g. the local authority;
- provide technical support to the staff and pupils;
- manage reliability problems to reduce their impact on learning and classroom routines;
- provide training/staff development opportunities for staff to integrate ICT into the curriculum;
- encourage staff to share good practice in the use of ICT for teaching and learning;
- achieve an appropriate blend of desktop and portable computer availability to maximize the flexibility and cost effectiveness of provision;
- establish and maintain good working partnership arrangements with the community provision;
- be aware of the need to balance the security issues for pupils with the community needs, to ensure user-friendly access for adults in shared school/adult provision.

Laptop/tablet PC use

- invent systems and protocols which embed a culture and expectation of use by teachers and pupils;
- consider the most effective deployment of laptop/tablet PCs within the school to benefit pupil use.

13.5.3 Teachers

Need:

- technical support;
- training/staff development/time to fully integrate ICT into curricular areas.

Should:

- create lesson start-up routines and procedures which pre-empt problems of initial computer and network start-up delays.
- create an expectation that laptop/tablet PCs will be used for most lessons if pupils are given personal use of one;
- give more ownership/control of ICT use to empower pupil learning;
- consider adapting the curriculum to using ICT, rather than simply using as a tool;
- acknowledge the ICT skills/knowledge pupils already have from their own personal and social uses.

13.5.4 Pupils

Need:

- a dedicated person within the school to go to for technical support;
- a place to store a laptop/tablet PC to save carrying it around all day.

Should:

- have an expectation that laptops/tablet PCs will be used for most lessons;
- be given greater responsibility and opportunity to choose when to use ICT;
- take responsibility for using a laptop/tablet PC.

13.5.5 Community

Need:

- regular on-site presence of staff to encourage and sustain student provision;
- establish and maintain good working partnership arrangements with the school;
- a dedicated separate entrance in a shared school/community building.

APPENDIX 1

ARDNAMURCHAN HIGH SCHOOL PUPILS' PERSPECTIVES

Table 4.2.2 What was ICT used for?
(percentage of questionnaire responses)

	S1/S2 N=43	S3/S4 N=33	S5/S6 N=4	S1-S6 N=80
In school I use the Tablet/Laptop PC to	Often/ Sometimes	Often/ Sometimes	Often/ Sometimes	Often/ Sometimes
present final copies of stories, letters or reports.	98	85	100	93
search for information on the Internet.	91	88	75	90
make PowerPoint slides.	93	79	100	86
draft stories, letters or reports.	88	79	100	85
play music.	81	88	75	84
draw or design.	84	47	100	71
send e-mail to friends in school.	81	57	50	70
use a spreadsheet to do calculations.	81	52	50	68
create multimedia presentations.	72	55	50	64
draw graphs from a spreadsheet.	84	30	50	60
insert downloaded pictures into text.	70	45	75	60
create a web page.	58	64	50	60
store information in a database.	54	67	25	58
make animations.	63	45	25	54
search for information in a database.	58	49	25	53
play simulation games.	47	33	25	40
complete a task or worksheet downloaded from the school network.	35	45	50	40
work with scanned pictures or text.	33	42	50	38
write a diary, journal or record of work.	49	21	50	38
send e-mail to other people.	19	33	50	26
copy and type up information from the teacher's board or screen.	30	15	100	24
use digital video.	19	24	25	21
make or compose music.	21	21	0	20
capture data with a sensor (data-logging).	16	15	75	19
display or send digital photographs.	12	21	50	18
do my own programming.	19	15	0	16
learn from an interactive program e.g. All About the Weather.	7	15	0	10
download a homework task from the school network.	5	15	25	10

APPENDIX 2

ARDNAMURCHAN HIGH SCHOOL PUPILS' PERSPECTIVES

Table 4.2.3b The Level of Computer Use by the S1-S6 pupils

(*These figures show the % of that sub sample of pupils who actually took the subject the previous week).



Indicates this subject not taken by the year group

	S1/S2	S3/S4	S5/S6	S1/S2	S3/S4	S5/S6	S1/S2	S3/S4	S5/S6
	% who had this subject last week	% who has this subject last week	% who had this subject last week	* % who used a tablet/laptop in this subject last week	* % who used a tablet/laptop in this subject last week	* % who used a tablet/laptop in this subject last week	* % who used a desktop in this subject last week	* % who used a desktop in this subject last week	* % who used a desktop in this subject last week
Science	98			3			3		
(Physics)		30	75		70	100		10	0
(Biology)		61	75		20	67		10	0
(Chemistry)		42	0		7	0		7	0
(Aquaculture)		9			0			100	
Social Subjects	84			0			0		
(History)		18	0		17	0		17	0
(Geography)		67	75		5	67		0	0
Technical	72			0			65		
(Practical Craft Skills/Craft & Design)		70	25		4	0		91	100
(Graphical Communication)		3			0			100	
(Admin)		9			67			100	
PC Passport		27	0		0	0		89	0
Business Management	26	3		0	0		55	0	
Gaidhlig		3	0		0	0		0	0

APPENDIX 3

ARDNAMURCHAN HIGH SCHOOL PUPILS' PERSPECTIVES

Table 4.3.1 The Positive Aspects of ICT Use
(percentage of questionnaire responses)

What I like about using the laptops/ tablets in school	Agree a lot/ Agree			
	S1/S2 N=43	S3/S4 N=33	S5/S6 N=4	S1-S6 N=80
It makes it easier to edit or change my work.	88	88	75	88
It makes my work look neater.	88	88	75	88
I can find information that I cannot find in books.	81	76	100	80
I can save my work in a safe place.	81	82	25	79
I can easily continue my school work at home.	84	61	50	73
I can show my work at home.	81	67	25	73
I am learning a lot about how to use a computer.	79	70	25	73
I can continue my work at lunchtimes.	77	67	50	71
It makes school work more interesting.	77	52	75	66
I get to use the Internet during lessons.	68	58	50	63
I get to send e-mails.	61	61	75	61
It is great fun.	74	33	75	58
I get to use my own ideas.	72	42	25	58
It helps me to do better at school work.	63	49	25	55
I can do tasks faster with the Tablet/Laptop PC.	54	55	50	54
It has helped me to learn or understand more in some subjects.	61	39	75	53
I like that I don't have to carry lots of paper/exercise books around.	54	27	25	41
I can use the Tablet/Laptop PC in most classes at any time.	30	12	75	25
Using the Tablet/Laptop PC makes me feel better about myself.	26	6	0	16

APPENDIX 4

ARDNAMURCHAN HIGH SCHOOL PUPILS' PERSPECTIVES

Table 4.4 The Negative Aspects of ICT use.
(percentage of questionnaire responses)

What I don't like about using the laptops/ tablets in school	Agree a lot/ Agree			
	S1/S2 N=43	S3/S4 N=33	S5/S6 N=4	S1-S6 N=80
The Tablet/Laptop PC is too heavy to carry around.	63	94	25	74
The Tablet/Laptop PC doesn't link up easily with the computer I use at home.	77	70	50	73
There are too many technical problems.	49	76	75	61
The Tablet/Laptop PC breaks down too easily.	51	61	75	56
I have to charge the Tablet/Laptop PC too often.	56	55	50	55
I worry that I might break something so expensive.	56	39	50	49
The programs on the Tablet/Laptop PC are not as good as the ones on the computer at home.	51	52	0	49
I don't get to use the Tablet/Laptop PC in school often enough.	42	52	25	45
The Tablet/Laptop PC does not work reliably with the school network.	44	43	50	44
I lose my work files too often.	37	55	0	43
The work I have to do on the Tablet/Laptop PC is boring.	40	43	50	41
The teacher doesn't let us try things out for ourselves.	37	49	0	40
The work I have to do on the Tablet/Laptop PC is too hard.	16	9	0	13
I don't like using the Tablet/Laptop PC in school because I'm too slow at typing.	9	15	0	11
The work I have to do on the Tablet/Laptop PC is too easy.	9	12	25	11
I do not have anyone to go to in school if I have problems with my Tablet/Laptop PC.	12	0	0	6

APPENDIX 5

GLEN URQUHART HIGH SCHOOL PUPILS' PERSPECTIVES

Table 9.2.2 What was ICT used for?

(percentage of questionnaire responses)

	S1/S2 N=77	S3/S4 N=58	S5/S6 N=25	S1-S6 N=160
In school I use a Desktop or Laptop PC to	Often/ Sometimes	Often/ Sometimes	Often/ Sometimes	Often/ Sometimes
present final copies of stories, letters or reports	97	91	100	95
Search for information on the Internet	95	95	80	93
Play music.	83	93	80	86
draft stories, letters or reports.	82	76	96	82
insert downloaded pictures into text.	88	78	64	81
play simulation games.	75	86	80	80
search for information in a database.	79	79	72	78
store information in a database.	78	83	60	77
draw or design.	72	72	60	71
make PowerPoint slides.	90	53	40	69
draw graphs from a spreadsheet.	55	83	64	66
work with scanned pictures or text.	44	64	48	52
use a spreadsheet to do calculations.	51	59	36	51
complete a task or worksheet downloaded from the school network.	34	60	76	50
create multimedia presentations.	46	29	32	38
do my own programming.	31	43	32	36
write a diary, journal or record of work.	36	36	28	35
learn from an interactive program e.g. All About the Weather.	33	26	44	32
copy and type up information from the teacher's board or screen.	40	19	28	31
display or send digital photographs.	17	38	56	31
make animations.	33	29	20	29
download a homework task from the school network.	12	45	24	26
make or compose music.	16	31	16	21
create a web page.	18	26	16	21
send e-mail to other people.	17	21	24	19
use digital video.	13	19	28	18
capture data with a sensor (data-logging).	13	12	32	16
send e-mail to friends in school.	12	10	32	14

APPENDIX 6

GLEN URQUHART HIGH SCHOOL PUPILS' PERSPECTIVES

Table 9.2.3b The Level of Computer Use by the S1-S6 pupils

(*These figures show the % of that sub sample of pupils who actually took the subject the previous year).



Indicates this subject not taken by the year group

	S1/S2	S3/S4	S5/S6	S1/S2	S3/S4	S5/S6	S1/S2	S3/S4	S5/S6
	% who had this subject the previous year	% who has this subject the previous year	% who had this subject the previous year	* % who used a tablet/laptop in this subject the previous year	* % who used a tablet/laptop in this subject the previous year	* % who used a tablet/laptop in this subject the previous year	* % who used a desktop in this subject the previous year	* % who used a desktop in this subject the previous year	* % who used a desktop in this subject the previous year
Science	97	16		17	11		31	56	
(Physics)		50	44		7	27		10	82
(Biology)		33	52		0	8		11	46
(Chemistry)		48	24		4	0		21	50
Modern studies			8			50			100
Technology & Home Economics	97			19			45		
(Home Economics)		22	16		6	25		25	25
(Craft & Design)		22	12		46	33		46	100
(Graphical Communication)		48	24		61	50		82	100

APPENDIX 7

GLEN URQUHART HIGH SCHOOL PUPILS' PERSPECTIVES

Table 9.3.1 The Positive Aspects of ICT Use
(percentage of questionnaire responses)

What I like about using the ICT in school	Agree a lot/ Agree			
	S1/S2 N=77	S3/S4 N=58	S5/S6 N=25	Total N=160
It makes my work look neater.	96	93	88	94
It makes it easier to change my work.	94	95	88	93
I can find information that I cannot find in books.	95	85	92	91
I can save my work in a safe place.	94	90	80	90
I like that I don't have to carry lots of paper/exercise books around.	92	90	72	88
It makes school work more interesting.	96	85	72	88
It is great fun.	92	90	72	88
I am learning a lot about how to use a computer.	90	86	72	86
I can do tasks faster with a laptop or desktop PC.	88	83	80	85
I get to use the Internet during lessons.	79	86	96	84
I can continue my work at lunchtimes.	81	74	80	78
I get to use my own ideas.	81	72	56	74
It has helped me to learn or understand more in some subjects.	73	72	72	73
It helps me to do better at school work.	81	64	60	71
I can easily continue my school work at home.	66	64	52	63
I can show my work at home.	64	50	44	56
I can use the laptop or desktop PC in most classes at any time.	49	45	60	49
Using the laptop or desktop PC makes me feel better about myself.	55	40	32	46
I get to send e-mails.	25	10	40	22

APPENDIX 8

GLEN URQUHART HIGH SCHOOL PUPILS' PERSPECTIVES

Table 9.4 The Negative Aspects of ICT Use.
(percentage of questionnaire responses)

What I don't like about using ICT in school	Agree a lot/ Agree			
	S1/S2 N=77	S3/S4 N=58	S5/S6 N=25	S1-S6 N=160
The laptop or desktop PC does not link up easily with the computer I use at home.	44	59	68	53
I don't get to use the laptop or desktop PC in school often enough.	47	47	8	41
The programs on the laptop or desktop PC are not as good as the ones on the computer at home.	42	47	24	41
There are too many technical problems.	33	31	44	34
The teacher doesn't let us try things out for ourselves.	42	28	12	32
I worry that I might break something so expensive.	36	28	20	31
The work I have to do on the Laptop or desktop PC is boring.	31	31	28	31
The laptop or desktop PC breaks down too easily.	25	29	36	28
The laptop or desktop PC does not work reliably with the school network.	18	24	20	21
The work I have to do on the laptop or desktop PC is too easy.	17	24	8	18
I lose my work files too often.	9	22	16	15
I don't like using the laptop or desktop PC in school because I'm too slow at typing.	13	12	16	13
The work I have to do on the laptop or desktop PC is too hard.	10	14	12	12
I do not have anyone to go to in school if I have problems with my laptop or desktop PC.	8	9	12	9